OCTOBER, 1940

ELECTRICAL SOUTH

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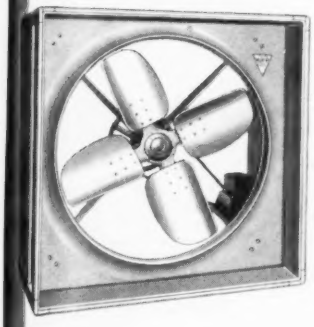

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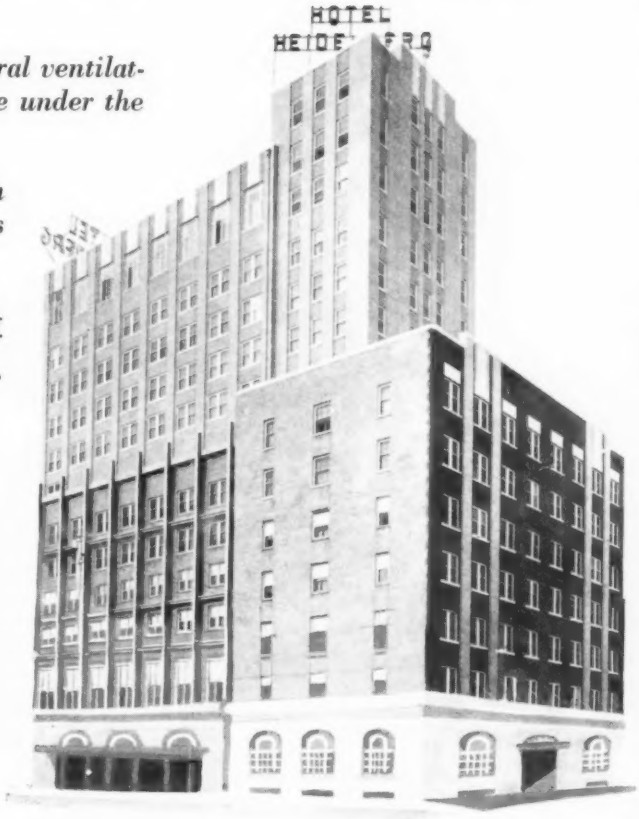

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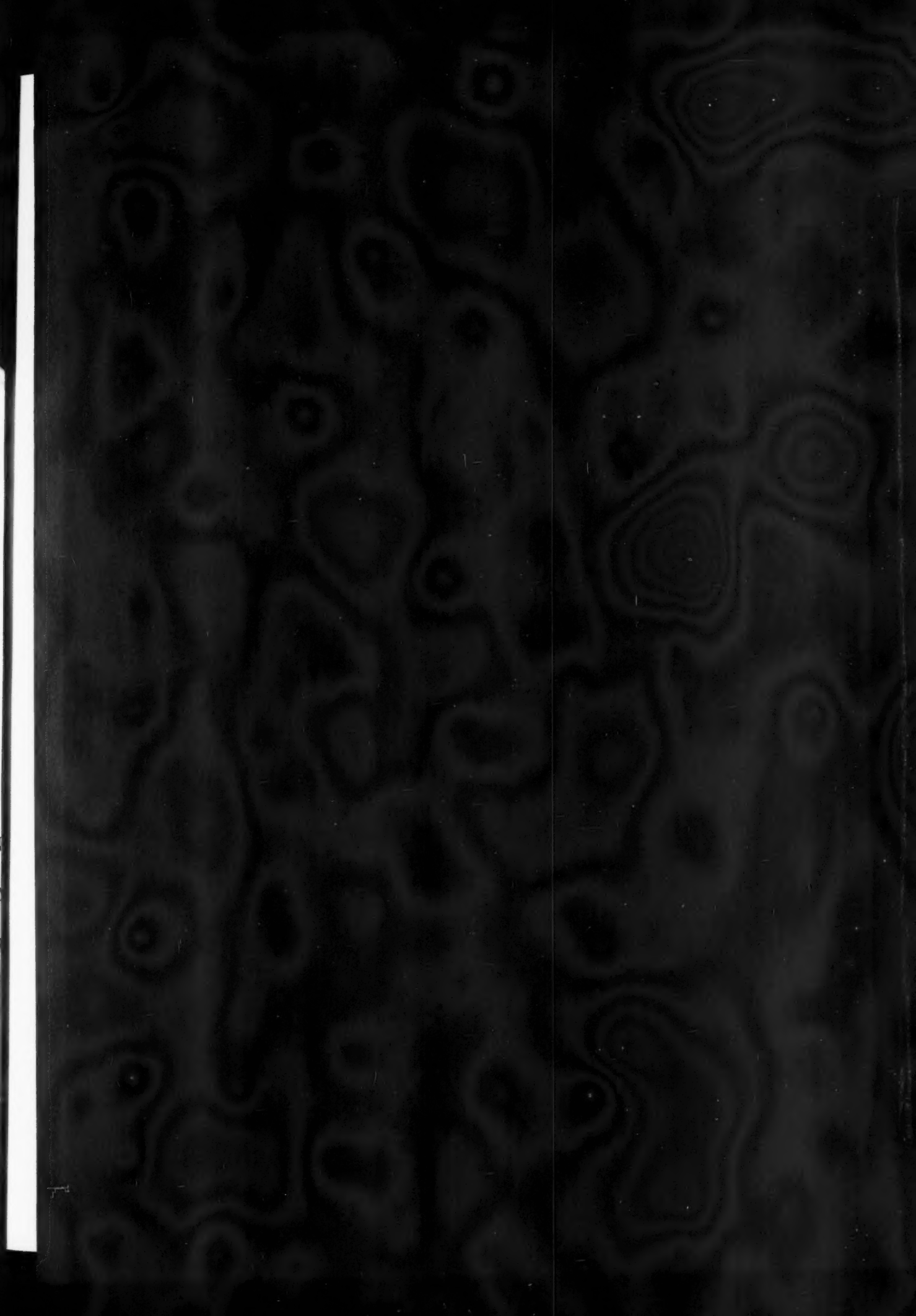

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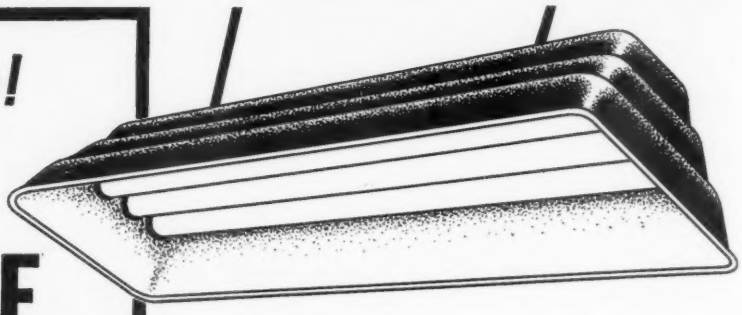
Volume 20 Number 10

Now Ready!

COLD CATHODE FLUORESCENT LIGHTING



MANY ADVANTAGES FOR EVERY ILLUMINATION PURPOSE!

Before you install another Fluorescent Lighting system, get the facts on the advanced, versatile, easy-to-install COLD CATHODE method! Consider the following advantages of the COLD CATHODE over the limitations of the present Hot Cathode type:

A Cold Cathode installation in a Georgia Movie Theatre Lobby

INSTANT LIGHTING when switched on.

LOWER TEMPERATURE. Operates instantly at freezing temperatures, with no loss of intensity when installed for that purpose. Low heat radiation.

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We can supply you with the correct Amplifiers, Lamps, Housing and instructions for installation. Our engineering department and sales engineers are ready to assist in every way.

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24 pages of facts and figures to help you understand, sell and install Cold Cathode Fluorescent Lighting. Free on request to Lighting Engineers, Contractors, Architects and Wholesalers.

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Easier to Install

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Besides the new corrosion-proof finish Dualcote offers 4 new features that help the man who makes the installation.

(1) QUICK STARTING THREADS
Dualcote is chamfered before threading. There are no knife-edge threads to be burred, making it hard to start the coupling.

(2) CORROSION-PROOF THREADS
Dualcote threads are twice protected by zinc and a corrosion-proof coating. Rust-free threads help couplings screw on quickly.

(3) BETTER THREAD PROTECTION
No more running a die over battered threads! New steel caps protect the threads and keep out dirt during roughing in.

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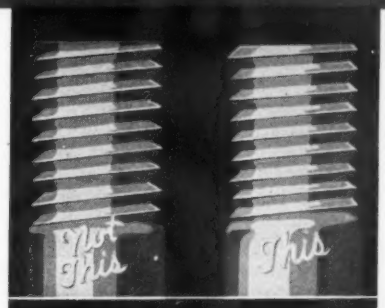
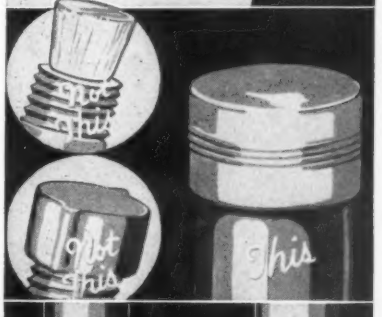
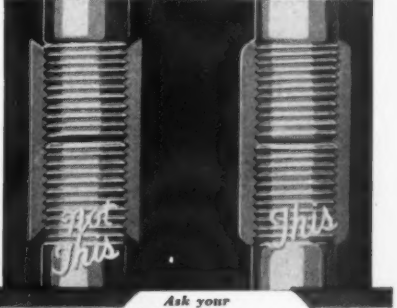
There is no charge for these extra advantages as Dualcote costs no more than other galvanized conduits.

If you are coming to the NECA show see the story of Dualcote told in colored movies at Booth No. 47.







WALKER of Conshohocken, Pa.

Ask your wholesaler or our nearest representative for a sample of this new material.

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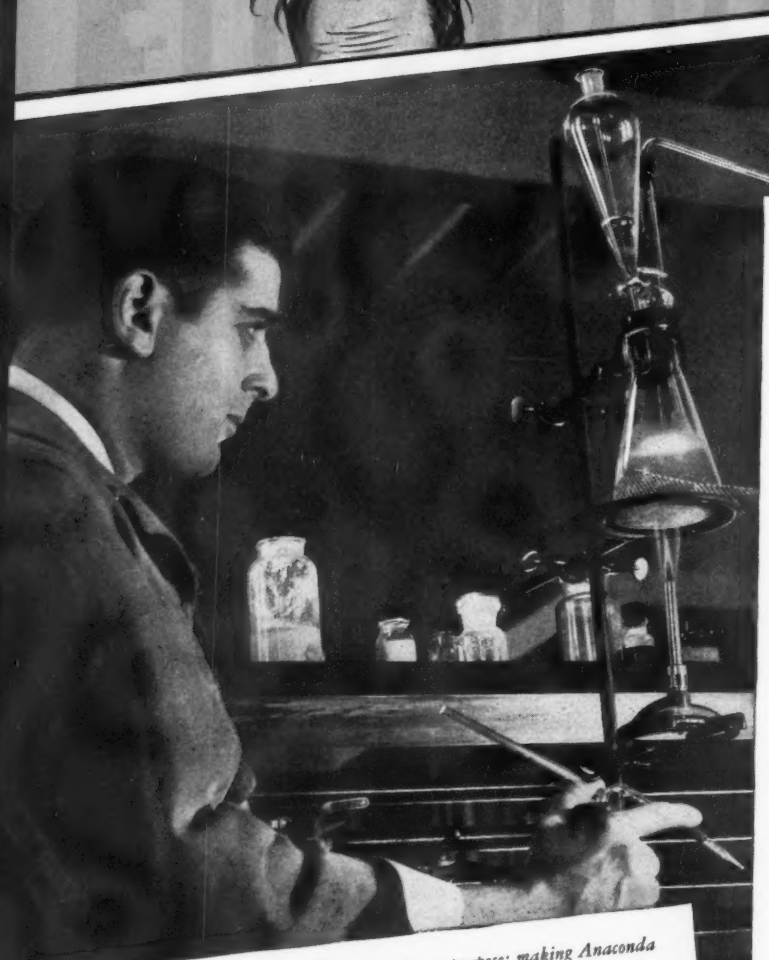
E. W. STURDIVANT, 3306 Wichita St., Houston, Texas

This man GETS IN PEOPLE'S HAIR



To see that you get the best cable possible he checks on all incoming materials...accepts only those that meet *Anaconda's Rigid Standards*

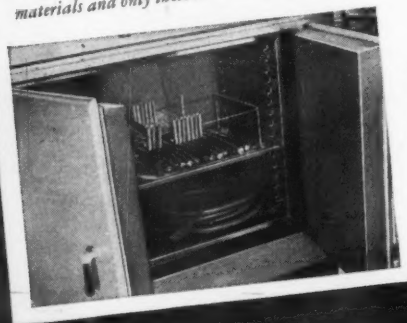
PERSONALLY, he's "tops" but when it comes to cable materials he's even harder to please than he is to fool. His eye is keen, his knowledge sound, his standards severe and he applies them all, accepting and rejecting the materials used in Anaconda Wire and Cable.

His task, and that of the other trained engineers and chemists entrusted with Anaconda research, is to protect quality...to insure that every length of wire and cable measures up to the name behind it...which means —flawless as the skill, science and long experience of Anaconda can make them.

40865

ANACONDA
from mine to consumer

This man plays no favorites. His job has only one purpose: making Anaconda Wire and Cable the best possible obtainable. Through his "lab" pass incoming materials and only those that live up to Anaconda's standards of quality get by.



Some materials must pass severe aging tests in this oven and many other tests, before being released for process. In this way, you are sure that you get the highest quality wire and cable when you buy Anaconda.

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OCTOBER, 1940

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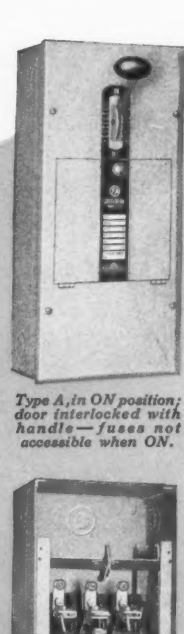
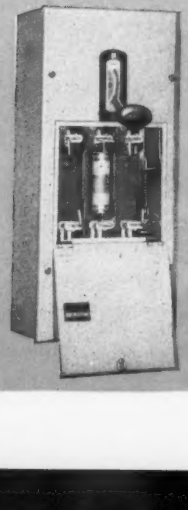
Something New . . .

in an ENCLOSED SAFETY SWITCH

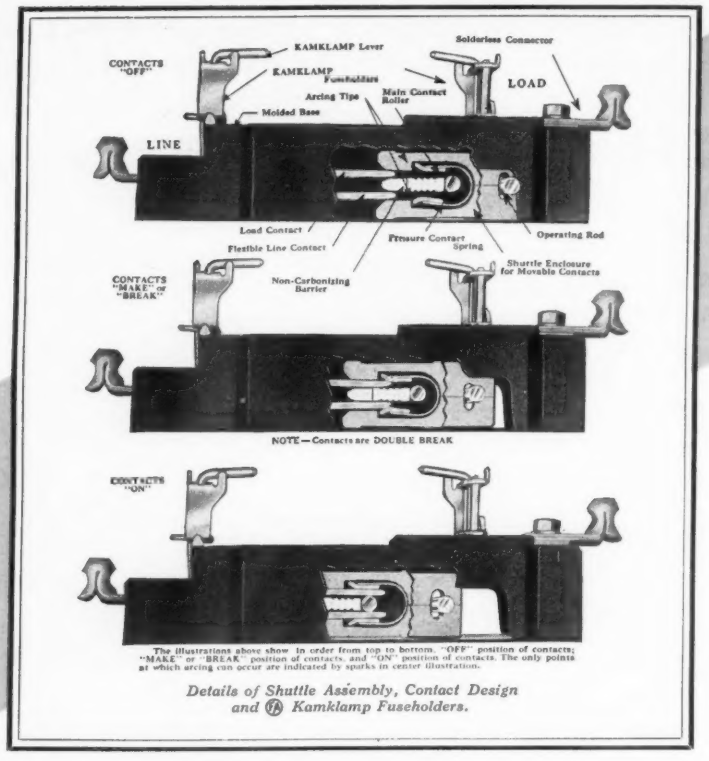
Type A, in ON position; door interlocked with handle — fuses not accessible when ON.



Type A, with front removed.



Type B, in OFF position; non-interlocking door — fuses accessible in either ON or OFF position.


CONTACTS "OFF"
KAMKLAMP Lever
KAMKLAMP Fuseholders
Arcing Tips
Molded Base
Main Contact Roller
Solderless Connector
LOAD
LINE
Load Contact
Flexible Line Contact
Pressure Contact Spring
Operating Rod
CONTACTS "MAKE" or "BREAK"
Non-Carbonizing Barrier
Shuttle Enclosure for Movable Contacts
NOTE—Contacts are DOUBLE BREAK
CONTACTS "ON"
The illustrations above show, in order from top to bottom, "OFF" position of contacts; "MAKE" or "BREAK" position of contacts, and "ON" position of contacts. The only points at which arcing can occur are indicated by sparks in center illustration.

Details of Shuttle Assembly, Contact Design and (FA) Kamklamp Fuseholders.

Here is a front-operated safety switch which embodies *entirely new ideas in both design and construction.*

The (FA) Shutlbrak Enclosed Switch is a high quality, heavy duty industrial switch for motor control, service entrance, and other disconnect installations. Its quick make and break connections are *held under compression.* It is equipped with Kamklamp fuseholders for either the ferrule or knife-blade types of fuse terminals.

The line and load connections are enclosed in the completely insulated shuttle, which contains the movable contacts — the auxiliary contacts on the ends of the compression spring, and the main contact roller. There is an arc-resisting barrier between the line and load contacts *at all times.*

The switchbox has ample room at top, bottom and *behind* the switch unit for wiring and connecting space.

The (FA) Shutlbrak Switch is available either with or without an interlocking arrangement between the operating switch lever and the door of the fuse compartment. It may be had for either surface or flush mounting.

Capacities at present: 30 to 200 amp., inclusive, for 250 volts AC or DC, and 575 volts AC, in 2, 3 and 4 poles. (Larger capacities in preparation.) Each switch is rated in horsepower. Approved by Underwriters' Laboratories as an Enclosed Switch.

The (FA) One-Piece Panel Switchboard When (FA) Shutlbrak Switches are mounted for switchboard assembly, each steel panel is self-contained, with all of the switch units connected to the branch bus bars of that section. These branch bars are connected to a vertical set of bus bars, which are in turn connected to horizontal bus bars. The latter are supported at either top or bottom, whichever is most convenient to connect the service entrance cables.

The new design (FA) Shutlbrak Switch Switchboard is furnished individually enclosed, with a junction box built into the top of each panel.

For more Complete Information write for Bulletin No. 59; also for *new* Catalog No. 56 . . . Frank Adam Electric Company, St. Louis, Mo.

EST. 1891 THE SIGN OF A FA BETTER JOB

Frank Adam

ELECTRICAL PRODUCTS

for Industry

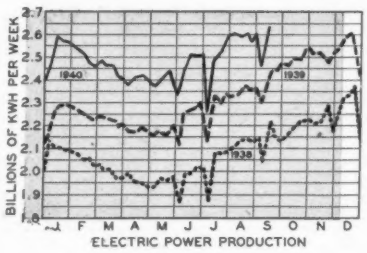
FRANK ADAM ELECTRIC CO.
ST. LOUIS, MO. U.S.A.

Electrical Business Trends

NEW construction and improved retail trade are bright spots on the economic horizon at the present time. Retail trade reports have been close to the best of the year considering the season. Merchants expect their fall business to be better than last fall, but there are indications that inventories are not being greatly increased at this time.

Undoubtedly, the defense contracts that have been placed in increasing amounts since June will have a stimulating effect on employment, construction and demands for materials even before the close of the year. Increased industrial employment and payrolls will result in an increased demand for automobiles, refrigerators, and other such items, and many manufacturers are planning for unusually large volumes of output during the last quarter of 1940 and the early part of 1941.

New construction has already reached the highest volume since 1930, due both to record activity in small home building and to industrial contracts representing the beginnings of plant expansion for armament requirements. The latter type of construction also affects the volume of small home building because new housing for workers is usually required when factories are put up in new places or plants greatly enlarged.



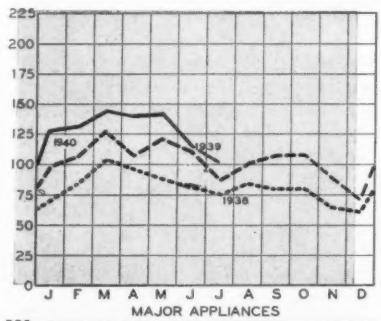
ELECTRIC POWER PRODUCTION

Per Cent Changes 1940 Over 1939	Week Ending Sept. 14	Week Ending Sept. 7
New England	+ 6.1	+ 4.5
Middle Atlantic	+ 7.9	+ 5.4
Central Industrial	+11.8	+12.4
West Central	+ 2.7	+ 4.6
Southern States	+ 2.9	+ 6.2
Rocky Mountain	+ 9.4	+12.0
Pacific Coast	+ 6.1	+ 3.9
Total	+ 7.9	+ 7.5

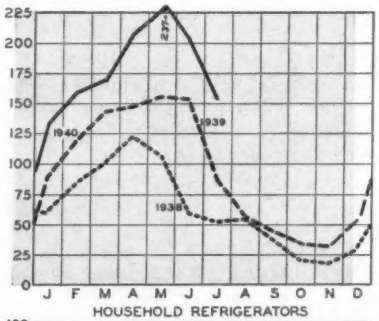
The South has not been neglected in the recent placement of government defense contracts. For the three-month period ending September 15, approximately $1,078,000,000 in contracts had been placed in Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Texas and Virginia. This figure does not include contracts not made public, nor orders that do not require contracts. It represents approximately one-sixth of the national total of $6,511,100,000 included in tabulation.

In the electrical industry, the increasing trend of activity was reflected in greater electric power production. For the week of September 14, output reached a new high of 2,638,634,000 kilowatt-hours, an increase of 7.9% over the corresponding week of 1939.

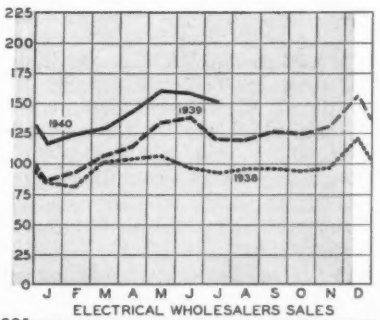
The charts below show electrical industry trends only up to August 1. Major appliances in July continued the usual seasonal decline from June but were well above sales for the same period of 1939. The substantial increases recorded for motors and generators and distribution equipment during the months of May and June were not continued in July. Sales of industrial electrical materials in July increased 5.8% over sales for June.



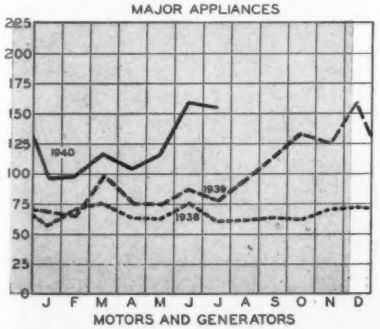
MAJOR APPLIANCES



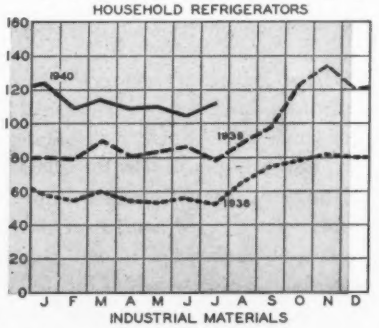
HOUSEHOLD REFRIGERATORS



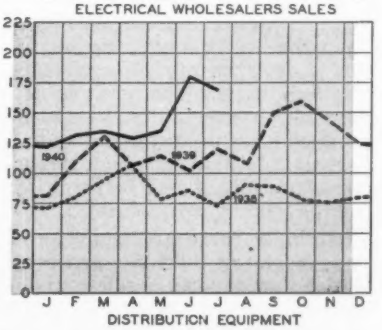
ELECTRICAL WHOLESALERS SALES



MOTORS AND GENERATORS



INDUSTRIAL MATERIALS



DISTRIBUTION EQUIPMENT

All of the above indexes of electrical business activity are based on figures available from the National Electrical Manufacturers Association, except the index of electrical wholesalers' sales which is based on data published by the United States Department of Commerce. The indexes on motors and generators and distribution equipment are based on orders received, while the index on industrial materials, including such items as electrical porcelain, mica, vulcanized fiber and laminated products, is based on sales billed. The index on distribution equipment includes such items as high voltage insulators, paper cable, power switching equipment, power distribution transformers, and varnished cambric cable. The index on major appliances does not include refrigeration. The index on household refrigerators includes complete household refrigerators, separate household evaporators, and separate systems of 1/4 horsepower or less. The index on electric power production is based on data released by Edison Electric Institute. 1936 averages taken as 100%.

Shell Building Modernization Example of New Wire Use

SMALL-DIAMETER building wire, now recognized in the National Electrical Code, played an important part in the modernization of the Shell Building, Houston, Texas, completely rewired recently by the Jacobe Brothers Electrical Company, of Houston.

Fourteen years ago this 22-story building was wired by Jacobe Brothers according to what was then the best wiring practice. In the short span of fourteen years, the building had become obsolete to such an extent that its owners were willing to spend three-quarters of a million dollars to install air conditioning and to bring the wiring system up to date.

Actually there are many buildings no more than ten years old which now have an obsolete wiring system, one that is overloaded to such an extent that cost of energy losses alone over a period of time are almost enough to pay for the improvement needed in wiring to bring the system up to date.

The obsolescence is due to the demand for air conditioning, for better lighting, and because of the addition of numerous machines and equipment operated electrically. Of course, ducts for an air conditioning system cannot be installed without a certain amount of remodeling and construction work, but with the advent of the small-diameter building wires, old conduits can be used for rewiring without disturbing plastered walls and ceilings. These new small-diameter wires open up a tremendous and lucrative field for the electrical contractor, reducing the cost of adequate wiring to but a fraction of what it would be if new conduit had to be installed.

Office lighting shown in the photograph above is typical of that throughout the recently rewired Shell Building of Houston, Texas. Small diameter wire played an important part in bringing about this modernization work. Lighting wattage per floor was increased from 21 kilowatts to 33 kilowatts, the new load representing approximately four watts per square foot.

To retain his tenants, the building owner must modernize, and the aggressive contractor can now relieve one of the chief worries of the building owner by assuring him that this modernization of his electrical system can be done at reasonable cost—most of which will be returned through the more efficient operation of the wiring system.

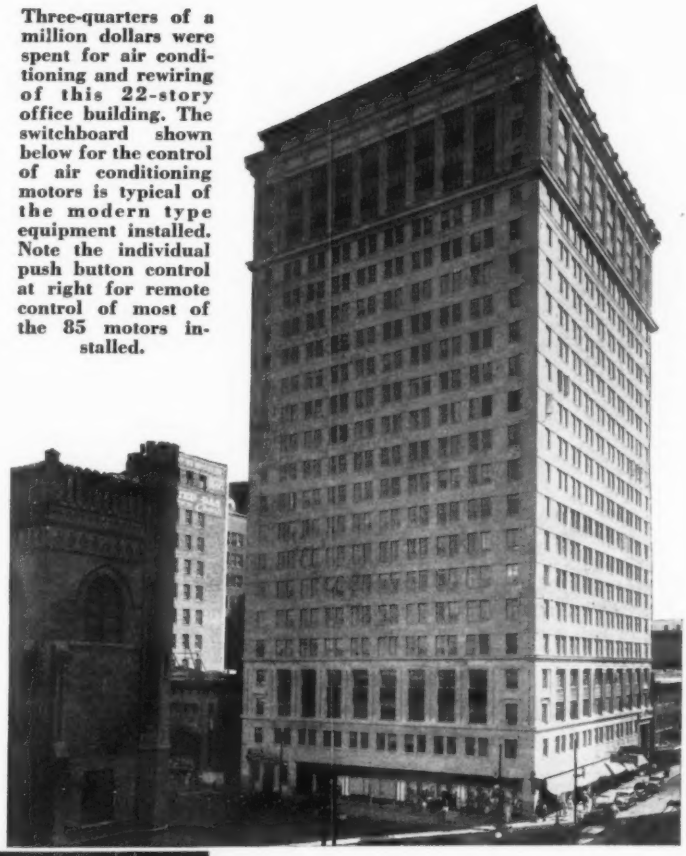
Describing the Shell Building job, R. L. Jacobe says, "The additional demands had gradually overloaded the job to such extent that service was unsatisfactory and operation costs much higher than they should have been. The new small diameter wire is exactly

what we needed to modernize a job of this kind. We were able to bring the wiring capacity of the building up to modern standards.

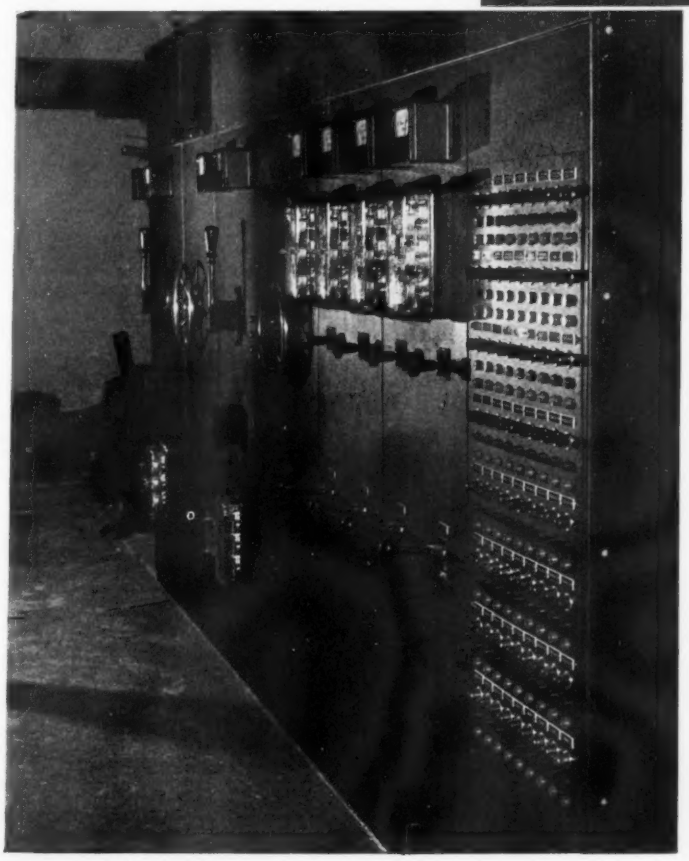
"Along with this work, we wired a total of 85 motors for completely air conditioning the building. We also took out all of the old combination ceiling fans and lighting fixtures, and replaced them with approximately one thousand 500-watt semi-indirect plastic fixtures.

"The value of an installation job of this kind is indicated by the fact that it will probably amount to half the annual business of an average contractor. It is time for the contractor to take samples of the new wire which makes such installations possible and go out and sell building owners whose systems are generally overloaded. Bear in mind that the overload, together with voltage drops, mean that many buildings are wasting as much as ten per cent of their lighting costs. If this story is properly presented to a building owner, it should certainly interest him.

"The very nature of such a job prohibits a competitive price as it practically must be performed on a cost-plus basis. This is where the contractor's past work, his reputation, and his ability to sell an engineer a modern installation earns him a worth-while profit—something that has been mighty hard to get during the past few years under the fierce competition of straight bidding on a fixed plan, and especially where, too often, the low bid governs."



Three-quarters of a million dollars were spent for air conditioning and rewiring of this 22-story office building. The switchboard shown below for the control of air conditioning motors is typical of the modern type equipment installed. Note the individual push button control at right for remote control of most of the 85 motors installed.



Following are some of the interesting details of the rewiring of the Shell Building:

In rewiring the building, the system was changed from a single phase, three-wire to a three-phase, four-wire system. An average of 150 new outlets and switches were added on each floor. The connected load was increased from 21,000 watts to 33,000 watts per floor. The new lighting load installed represents an average of four watts per square foot of floor area.

Complete remodeling of the upper ten floors, which are occupied by the Shell Corporation, required new partitions as well as new layouts for lighting fixture installations. However, the use of thin wall wire

(*Continued on page* 82)

Fluorescent Lighting Problems

An informative discussion based on a comprehensive survey of ninety installations of varied character and location.

By O. P. Cleaver*

**Commercial Engineering Dept.
Westinghouse Elect. & Mfg. Co.
Bloomfield, N. J.**

THERE is no denying that our lighting household has been disturbed by the advent of fluorescent lighting, the new "problem child" of the industry. Virtually all known methods have been tried many times in the effort to subdue this "problem baby" and put it in its place.

Those assembled here today want to understand this child, develop its good points to the eventual extinction of its bad habits, watch over its associates and bring it up to the full stature of a responsible future citizen of the lighting world. To do all this intelligently, we have to know how much of a problem this child is.

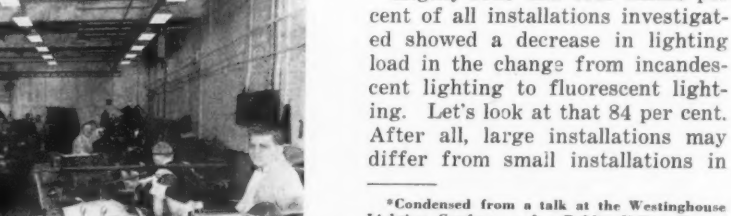
How bad an "actor upper" is this fluorescent lamp of ours? I took the obvious way of finding out the answer some six weeks ago when I sent to our entire sales force, covering the United States, a questionnaire with the request that they give me information on as many fluorescent lighting installations as they could investigate fully in the time allowed before this conference. I specifically asked that all investigated installations be typical, not the best or the worst, but the average; some large, some small, and as varied in classification as their territories afforded. It is the results of this survey which give us today the statistics upon which to base our answer.

Installations investigated were varied, with the small store predominating as it should, since the number of these changing to fluorescent lighting is far in excess of any other lighting applications. The 90 installations reported in the survey included 35 small stores, eight department stores, four window installations, 12 factories, two printing plants, 17 offices, one drafting room, three restaurants, one service station, one church and four banks.

These installations, moreover, were not located in a restricted area or in any one section of the United States or only in large cities. Reports were received from 26 states.

Eighty-four and four-tenths per cent of all installations investigated showed a decrease in lighting load in the change from incandescent lighting to fluorescent lighting. Let's look at that 84 per cent. After all, large installations may differ from small installations in

*Condensed from a talk at the Westinghouse Lighting Conference for Public Utility Executives, at Bloomfield, N. J.



Industrial lighting has many variations as to fixtures and spacing and it is well proven that the fluorescent lamp is adaptable to these different schemes. Here are two typical industrial installations. Above, an application of the new fluorescent Standard RLM industrial fixture designed to give well diffused general lighting in factories. Reflecting surface is porcelain enamel; two 40-watt lamps used with two-lamp control reduces stroboscopic effect; power factor is above 90 per cent; illumination level is above 25 foot-candles. Below, individual Alzak reflectors in groups of three make up single lighting units in this installation. White 40-watt lamps are used, wired so that each lamp of a group of three is fed from a different phase of a three-phase system, thus eliminating stroboscopic effect. Approximately 25 foot-candles are obtained.

many respects, but none of the facts are truly revealed in that overall figure of 84 per cent with a decrease in load. Hence, I divided the installations surveyed into five classifications, accoding to connected load. (See Table I, page 12).

Then I asked myself these questions:

Who said people would not accept higher levels if they could get them at no extra cost? Perhaps the story so frequently heard—"I don't need more light for seeing"—will not survive the fluorescent era.

Who said people would be confused by "power factor" and would not correct for it because they couldn't understand why? The larger installations investigated showed the greatest percentage of numbers corrected.

Who said that reduced loads would be taken care of by increased hours of use of this fine new light source? Statistics fail to substantiate this belief.

Can the fluorescent lamp be used as a means of raising this load out of the big gully? That's what all of us would like to know at this stage in our statistical survey.

Does reduced load mean 1914 lighting standards in these installations? The survey shows that the use of fluorescent lamps in the 90 installations boosted average lighting levels from 15 footcandles (before relighting) to 35 footcandles —an increase of 133 per cent! The average cost per footcandle was: Incandescent, 15 dollars; fluorescent, 19 dollars. Thus the fluorescent footcandle was 26 per cent more costly, on the average.

Two and one-half times as much average light is not to be sneezed at, with the average footcandle level of 35. This figure includes show windows and supplementary lighting levels for both incandescent and fluorescent installations, but since only four windows and an equal number of supplementary installations in factories were reported out of a total of 90, the 35 footcandles would be little affected by their exclusion. This figure is based on measurements made with small meters by lighting salesmen.

Frankly, it looks unreasonable that there should be an average reduction in load of some 50 per cent, as we shall see later, and an increase of two times as much light as before. Certainly the reported efficiencies of the lamp cannot account for that—but here are more statistics:

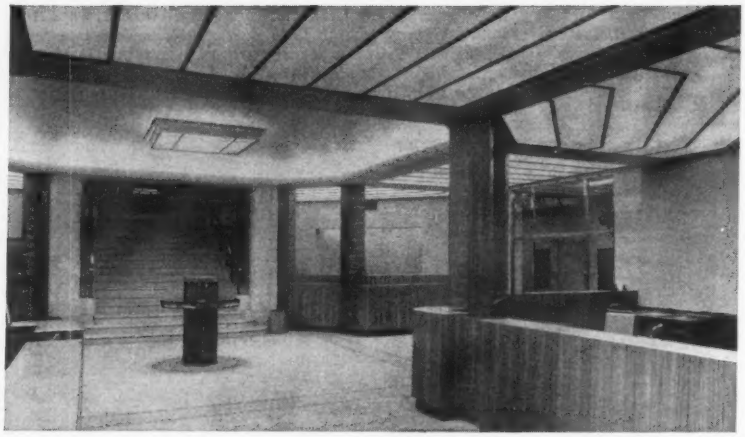
Only 26 per cent of the installa-

Fluorescent lighting may be applied in a number of different ways to produce a desired effect. Commercial lighting, where pleasing appearance is a factor to be considered almost as important as adequate illumination, may be accomplished by various fixture and mounting combinations, three of which are illustrated here:

Special built-in troughs, combined with indirect lighting over wall cases, and individually lighted showcase, make this small clothing store an outstanding example of what can be done to create "selling" lighting with the fluorescent lamp. Various sizes of white Mazda F lamps are used and all troughs are louvered to prevent glare. Over 50 foot-candles of general illumination is the result.

Streamlined fixtures with 40-watt white fluorescent lamps, enclosed by special diffusing glass with high transmission characteristics, light this display room to a level of 45 foot-candles. These shielded fixtures are typical of many now available for general lighting with fluorescent lamps.

Although the 40-watt fluorescent lamp is relatively low in brightness, its use in direct line of view without proper shielding is not recommended where continuous seeing is involved. Widespread use of unshielded lamps in stores has occurred, but such practice generally cannot be recommended. In this small store, ceilings are high and the contrast between ceiling and lamp brightness has been reduced by indirect lighting with fluorescent lamps on top of the wall cases.



Utilitarian beauty has been achieved in the bank shown above by creating the effect of a ceiling of skylights. White lamps back of the diffusing glass panels provide over 60 foot-candles of general illumination. The long tubular shape and low radiant energy output of these lamps make them ideal for such applications. At right, typical semi-indirect, louvered fixtures for office use. These produce 50 foot-candles.

tions investigated were shielded with louvers, coffers, glass, or used indirectly in coves. This, in part, explains the great increase in reported illumination. Consider also the fact that readings of the former incandescent installations were made undoubtedly with fixtures in many cases poorly maintained, while the fluorescent installations were new and in better condition.

The fact remains, however, that lighting levels were raised greatly, and the cost difference reported per footcandle is not as wide as we might have surmised. Only 30 of the 90 installations are considered in these particular figures; data was not available on the others. Since many of these installations had been installed some 18 months ago, before lamp prices were reduced, I believe that this cost differential soon will narrow down considerably.

There's no denying we are interested in how much load reduction, even though lighting standards should come first in the interest of better service to the public. Let us look at a breakdown of these reductions: (See Table II, at right). Not shown in the table, the average load change for these installations having reduced loads was 3,055 watts; average per cent reduction was 54.6.

Unexplainable in Table II is the apparent deviation from the rule in the 2000-4000 watt classification. Perhaps this middle group has been reached more effectively than any other with the "Better Light—Better Sight" story in the past.

There is another side to this story, also—the side of the lamp dealer and fixture dealer. Naturally they want profits, and it has been said that one way to get them is to sell fluorescent lamps and fixtures. Our survey gave a few statistics on this question. The incandescent lamps in those 90 installations were supplanted by fluorescent lamps, so far as sizes and dollars are concerned. It would seeem that 20- and 40-watt fluorescent lamps are carrying on a successful blitzkrieg against 200-, 300- and 500-watt incandescent lamps.

Consider what this means to these dealers. First, this survey indicated that $1,000 worth of incandescent lamps were replaced by $8,000 worth of fluorescent lamps which, when reduced to the same life basis, is still almost $3,000—three times the dollar value of incandescent lamps. Moreover, the fixture dealer sold 2,660 fluorescent fixtures (of course, at considerably more dollars each) to replace 2,260 incandescent fixtures in the 90 installations reported upon. They

(*Continued on page* 14)

Table I—Classification of Fluorescent Installations by Connected Load

Wattage Connected:	Below 1000	1000-2000	2000-4000	4000 10,000	Over 10,000
Number of Installations	25	29	21	11	4
% with Decreased Load	96	86	85	90	50
% with P. F. Corrected	60	79	76	72	100
% Reporting Longer Use	4	34	4	9	0
% with Higher Levels	96	100	100	100	100

Table II—Analysis of Fluorescent Installations Resulting in Reduced Connected Loads

Wattage Connected:	Below 1000	1000-2000	2000-4000	4000 10,000	Over 10,000
Number of Installations	24	25	18	10	2.
% of Installations with Load Reduced 0-25%	9	13	18	10	0
% of Installations with Load Reduced 25-50%	26	22	47	20	50
% of Installations with Load Reduced over 50%	65	65	35	70	50
% of Installations with Levels Increased 0-25%	50	25	50	0	0
% of Installations with Levels Increased 25-50%	50	50	25	0	50
% of Installations with Levels Increased above 50%	0	25	25	100	50

Contract Profits Protected by Careful Cost Accounting

JUST as there is no rose without thorns, so are there often thorns in the apparently desirable "big" electrical contracts. The bigger the job, the greater the chance for miscalculation in costs, for unexpected troubles or extra expense, and the greater the amount of money involved. While a big contract may net a handsome profit, by the same token a contractor can "lose his shirt" on one, if his bid is not based on precise estimates of all costs and hazards involved. Such estimates, plus a well-organized system of handling the various stages in such work step by step, is the foundation of a long period of successful and profitable operation by the Eugene Ashe Electric Company of Fort Worth, Texas.

Pointing out that his firm has for years specialized almost exclusively in wiring jobs in large buildings, public buildings and municipal plants, Mr. Ashe emphasized the great difference in the ultimate outcome which can be made by a small error in estimation.

"To meet this problem, we evolved a system of cost estimation which, from long experience, we know will give us figures that are accurate," he comments. "We use the unit price system from start to finish, and break down the cost per unit of every phase of a job, rather than trying to 'jump-estimate' different phases in a jump. Here, also, our careful records of past jobs come into play, since they show us the actual proven cost on different types of work, and furnish a key to all items of expense outside actual materials."

Large-scale wiring jobs cited by Mr. Ashe in illustrating his joint were such as the wiring of the municipal light plants in Electra and Robstown, Texas, the distribution systems in Weatherford and Bryan, Texas, and a multiple-unit Federal Housing Project in Houston, Texas.

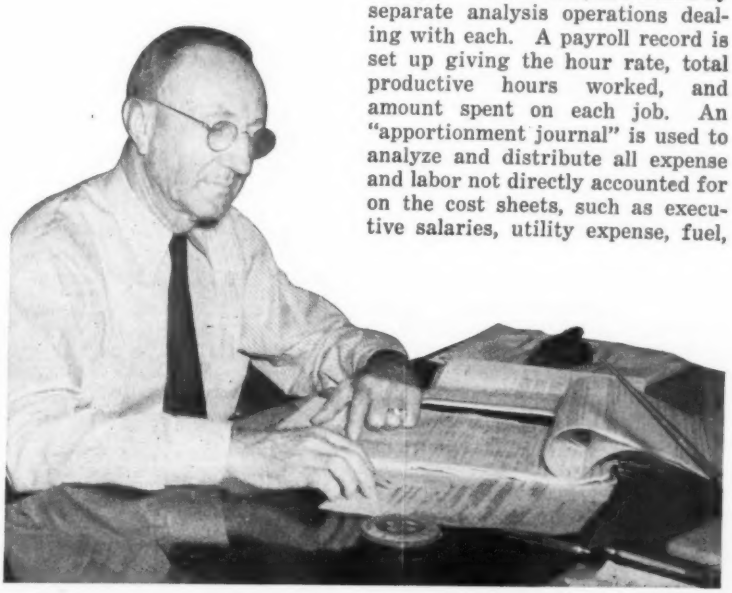
The unit price system, upon which the company bases all bids, consists of listing on estimate sheets every item of material separately, grouped under such subheads as wire, fixtures, insulators, conduits, tubing, tape, fuses, and so on. The Ashe Company developed a special form for this cost estimate work, upon which the correct quantities of all materials are entered separately, multiplied by the unit price and the correct total extended.

Next, the cost is listed on the sheet of overhead and handling items, such as drayage, freight, outside merchandise, bonds, room and board for workers (on out-of-town jobs), transportation, supervision expense, drafting expense, insurance, general production expense and miscellaneous expense. Labor costs are entered accurately from data compiled on labor costs involved in similar work on completed jobs. The total is drawn, a sound percentage of profit added, and the bid is ready.

One of the most important phases of this estimation system is the maintenance of very accurate records of costs on each job for the basis of future estimates. These records include a cost sheet ledger showing each job by number, name and date started and completed. The amount and cost of material used is listed, the total number of hours used in labor and the amount paid, the expense rate and the grand total. This furnishes a finger-tip reference to any job at any time with reference to any phase of expense. More detail can be obtained if necessary by going back into the job ledger referring to any specific job.

As a matter of profit insurance, Mr. Ashe maintains also a "Work in Progress Account," which keeps up to date the cost of various jobs until completed. A purchase journal records purchases of materials and supplies, freight and express, water, construction and repair, salaries and sundries, step by step as the job progresses, so that at any time, he can check up and see whether actual costs are running over estimated expense, and tighten up at once if they are. A double check is kept on supplies by a "materials and supplies" record kept at the headquarters warehouse, showing all requisitions. At the end of the month, the total of all requisitions are credited to this account, and the purchases are debited to it.

Those two intangible bugaboos to all cost accounting, labor costs and general overhead, are licked by separate analysis operations dealing with each. A payroll record is set up giving the hour rate, total productive hours worked, and amount spent on each job. An "apportionment journal" is used to analyze and distribute all expense and labor not directly accounted for on the cost sheets, such as executive salaries, utility expense, fuel,



Eugene Ashe at his desk checking estimates and contract.

depreciation, taxes, insurance, repairs and maintenance. Each job absorbs its proportionate share of these items, so that there is left no ragged fringe of general expense to eat into net profit at recapitulation time.

These factors are also taken into consideration in basing an estimate, so that cost sheets reflect the actual expense plus a proportionate share of general and administrative expense. A complete analysis of any phase of labor cost may be made at any time, from an accurate time record kept of daily hours worked on every job by every employee, showing rate, hours worked each day, total delays, and causes of delays. This accumulated data represents a valuable cross section of all phases of electrical labor as a whole, and specific reference to specific types of work.

Jobs Planned in Stages

Preparing for a job by definite stages is part of Mr. Ashe's system for doing the job within his estimate. The working schedule for each job is made up in advance, each floor of the structure, if it is a building job, or each stage of the work if a power distribution job, is considered separately. From the general layout sheets, the working schedule is determined chronologically step by step. The total time on the job is figured, then divided into stages. The first stage is laid out, and a definite number of working hours assigned to it, and so on with each stage of the work. The work on each stage is thus given a quota of hours within which it must be completed and the men work to that end.

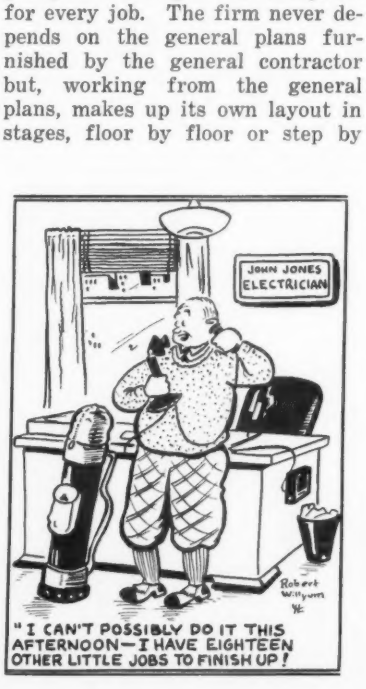
This division of jobs into stages also works a marvelous efficiency in material handling and ordering, and develops an extra economy as well. The material needed for each step is determined, and entered on the working schedule. From this schedule, a schedule of correctly spaced shipping dates is worked out so that material will be delivered when needed and not before, such instructions being given with each order. Orders for the entire job are usually placed at one time, but subject to individual shipping dates of different items, and subject to subsequent cancellation or change if necessary. In this way, materials arrive just when they are needed, and handling and warehousing expense is saved. There is no danger of a temporary shortage of miscellaneous supplies, for the company keeps a stock of general material amounting to about $10,000 on hand in the headquarters warehouse at all times, which can be requisitioned if necessary. It, however, is regarded as capital stock, and outside purchase deliveries are geared to meet the progress of the work.

By spacing the time of arrival in this manner, the contractor is able to pay for the material at intervals, which enables him to discount all his bills, and still keep the minimum amount of working capital tied up, saving on administration interest, and making for a more evenly distributed budget.

Delivery dates are so timed that all necessary materials will be delivered to the job site when needed, so that there is no delay in progressing. The firm builds a headquarters warehouse when necessary, or if a smaller one will suffice, uses its portable warehouse which can be moved from job to job. A shop is set up in the warehouse for the handling of make-up work, so no time is lost in transit.

This delicately balanced system of deliveries and material handling requires absolute accuracy in predetermining the various stages of the job and the time allotted each, and this is insured by Mr. Ashe's policy of making his own layouts for every job. The firm never depends on the general plans furnished by the general contractor but, working from the general plans, makes up its own layout in stages, floor by floor or step by step, duplicating the original plan, but embodying the contractor's own notes for guidance, such as time schedule references, detailed specification figures, and confidential instructions to the foreman on each job. These separate layouts are mounted on beaverboard for the foreman's use, and provide the literal map by which he steers his part of the work.

The clockwork accuracy with which Ashe's contracts meet their schedules is equalled by the clockwork regularity with which he meets his cost estimates on the nose and rings up consistent profits on every job.



Any Jacksonville contractor on Tuesday, October 22 . . . the big day for contractor golfers at Ponte Vedra Club during the N.E.C.A. convention.

Fluorescent Lighting Problems Surveyed

(*Continued from page* 12)

want lighting dollars, also! And how many more lighting dollars they will have when we arrive at that stage where lighting loads are increased—not slashed—to give the public eyesight saving levels. How many, many more lighting dollars that will mean for our industry, and how many, many more healthy eyes for the public!

But something has to be done about this problem child of ours, before all this can happen. These statistics show us how bad an "actor upper" he is. Now let's consider what to do about it.

Knowing how bad an actor your child is, don't knock him down. Build him up. Here are some rules:

(1) *Know His Good Habits*—Employees should be educated to know the "good habits" of the fluorescent lamp, in fact, to know the fundamentals of every kind of lamp and lighting.

(2) *Tell Others About Them*—By publication advertising, by direct mail, and by public meetings, educate and lead the industry.

(3) *Believe in Fluorescent Lighting*—The last is the most important rule of all. To date some three million lamps are performing good lighting service; they have performed in an acceptable manner when their good qualities have been known, appreciated, and directed toward the proper ends—eyesight conservation.

This modest program is just the beginning of the training of our problem child. It's not even a new idea program—we don't need a new one. "Better Light—Better Sight" is still the best one. All we need now is new vigor and lots of it!

CONVENTION PROGRAM

38th Annual Convention of National Electrical Contractors' Association

THE general sessions of the 38th Annual Convention of the National Electrical Contractors Association to be held at the George Washington Hotel, Jacksonville, Florida, will begin Monday morning, October 21, and will extend through Wednesday evening, October 23.

Preceding the general sessions, there will be a meeting of the Executive Committee on Saturday, October 19th. Delegates arriving Sunday will be guests at a reception of the Jacksonville Convention Committee followed by a buffet supper.

Monday, October 21st

9:30 AM—Markets and Sales Development

President's Address: Neca's Service to Our Members and the Industry; ROBERT W. McCHESNEY, President, N.E.C.A., Washington, D. C.

Report of the Secretary; LAURENCE W. DAVIS, General Manager, N.E.C.A., New York, N. Y.

Building Salesmanship in Electrical Contracting; D. B. CLAYTON, Chairman, N.E.C.A. Sales Development Committee, Birmingham, Ala.

Gold Seal Building Industries' Plan of Guaranteed Electric Wiring; WARREN PENN, Burbank, Calif.

2:00 PM—I.B.E.W. Employers' Section

Report of Labor Relations Committee; E. C. CARLSON, Chairman, N.E.C.A. Labor Relations Committee, Youngstown, Ohio.

Eliminating Industrial Disputes; D. W. TRACY, Assistant Secretary of Labor, Washington, D. C.

Apprenticeship Training; J. WALTER COLLINS, Chairman, N.E.C.A. Committee on Apprentice Training, and member of Federal Committee on Apprentice Training, Chicago, Ill.

7:00 PM—Dinner Sponsored by I.B.E.W. Section

Guest Speaker: EDWARD J. BROWN, President, International Brotherhood of Electrical Workers, Washington, D. C.

Tuesday, October 22

9:30 AM—Codes and Standards

Meeting the Need for Increased Adequacy; GEORGE ANDRAE, Chairman, N.E.C.A. Codes and Standards Committee, Milwaukee, Wis.

Calculating Conduit and Wire Sizes; HOMER G. KNODERER, General Electric Company, Bridgeport, Conn.

Branch Circuits and Feeders Under the 1940 *Code;* JOSEPH WHITNER, Assistant Chief Engineer, Southeastern Underwriters Association, Atlanta, Ga.

Standardization and Simplification; DR. MORTON G. LLOYD, Chief, Section of Safety Codes, National Bureau of Standards, Washington, D. C.

Afternoon and Evening

Recreation at Ponte Vedra Beach and Golf Club; Delegates will be guests of Jacksonville Chapter, N.E.C.A.

Wednesday, October 23

9:30 AM—Cost Data and Estimating

Taking the Gamble Out of Estimating; GEORGE W. PATTERSON, Chairman, N.E.C.A. Cost Data Committee, Toronto, Ont.

What Have You Got to Sell? Analyzing the Contractor's Organization; RAY W. ASHLEY, Research Engineer, Electrical Contractors Association of City of Chicago.

Reports and Discussions by Delegates.

Government Legislation as It Affects the Electrical Contractor, COL. O. R. McGUIRE, General Counsel, N.E.C.A., Washington, D. C.

2:00 PM—Industry Statistics

Better Knowledge of Our Industry; A. LINCOLN BUSH, Chairman, N.E.C.A. Statistical Surveys Committee, New York, N. Y.

What the Electrical Industry of the City of Miami is Doing Towards Adequate Wiring; ELLIS C. KNOX, Chief Electrical Inspector, Miami.

Election of Divisional Executive Committeemen.

Reports of Special Committees, and Resolutions.

7:00 PM—Annual Banquet, Hotel Mayflower

Presentation of James H. McGraw Contractor Award.
Entertainment and Dance.

An interesting program of entertainment has been prepared for the ladies by the Convention Committee of the Jacksonville Chapter, N.E.C.A. Outstanding feature of Monday's program will be a trip to Marineland. This will be followed by luncheon at the Munson Hotel; then a visit to St. Augustine to see the alligator farm, oldest house in the United States, Fort Marion, and many other points of interest. Bridge and an informal party in the evening will conclude the day's activities.

A trip through Jacksonville's residential section is planned for Tuesday. Following luncheon at the Florida Yacht Club, the ladies will be taken to the Ponte Vedra Beach Club for the afternoon and evening.

On Wednesday, the ladies will tour Jacksonville's scenic and historic attractions including Memorial Park, Oriental Gardens, and the DuPont Estate. They will have luncheon at the famous Harriet Beecher Stowe Lodge at Mandarin.

The delegates who take the six-day post-convention tour will leave the George Washington Hotel at 8:00 A.M. Thursday morning, October 24th. Highlights of the tour are as follows: (*Continued on pg.* 79)

Activities and Services of N.E.C.A.

Program for promotion of Association activities goes forward successfully under new committee organization

AT the start of 1940, National Electrical Contractors Association set up an orderly plan of promoting its activities under two major divisions: first, general benefit activities, which include all of the Association general activities and services, including general administration of the Association, and second, special benefit activities, which include only special activities, the benefits of which accrue only to a portion of the membership of the Association and are supported by that group of members. The wisdom of this plan has been demonstrated in this first year of its operation, and under the plan, the program of the Association has gone forward successfully.

Definite Program Outlined

A definite program for the year was laid down, divided into six major headings under general benefit activities, namely, sales development, statistical surveys, codes and standards, estimating and cost data, apprentice training, and national and regulatory legislation. Under the special benefit activities, the work of the Labor Relations Committee for I.B.E.W. employers section members has been carried forward.

This whole program for 1940 was not intended to be spectacular and we did not expect it to accomplish any miracles. It was designed to furnish to each member those services and information which are essential to the successful conduct of his business; it plans to develop new markets and to assist the member in educating his organization to sell his services; it seeks to establish statistics upon which we can chart our course in the future; it endeavors to create N.E.C.A. standards for the economic design of electrical installations; it has set up a strong front against all discriminatory legislation and for the protection of the rights and interests of electrical contractors; and it aims to encourage cooperation among our membership.

By Robert W. McChesney

President, National Electrical Contractors' Association, New York City, N. Y.

The electrical contractor is today, more than ever before, confronted with the necessity of *selling* his services, yet there is a vast market for electrical construction work which is practically untouched and which is available now if we will but develop it. There are thousands of existing buildings which need re-wiring to meet present day requirements. I am convinced that we can do the industrial and public utility work much more economically than the owners are now doing it with their own employees.

Sales Development

It is no easy task for the contractor to develop these markets because most of us do not have organizations of trained salesmen to tackle the job, and after all, it is a *selling job*. It is also an *engineering job* which requires plenty of practical experience in construction work. The qualified electrical contractor has the engineering ability and the pratical knowledge to do this work, but most of us do not have the *sales* ability or experience, because we have been merely quoting prices for many years and *selling* very little, if any.

After months of careful preparatory work, there was released in August to N.E.C.A. members, the first installment of a new monthly service, the "N.E.C.A. Manual of Sales Development," and additional releases of this manual will be issued on the 15th of every month hereafter. Like the N.E.C.A. Estimating Manual, it will grow more and more valuable with each year. It holds great possibilities for service to every member of the National Association, for there is no business, large or small, that cannot be strengthened by better selling methods.

This new Manual of Sales Development will be divided into three major sections, namely, "How to Sell," "Where to Sell," and "What to Sell." The first section, now being issued, covering "How to Sell," will include the principles of selling, the principles of advertising, and the engineering of the sale (the equipment and engineering practice required to discover the customer's needs).

The successful electrical contractor of the future will be the one who is constantly studying the needs of his selected customers and who has developed himself and his organization in the science of selling his service to the customer. The new N.E.C.A. Manual of Sales Development is an essential tool in every contractor's organization.

Every intelligent sales program must be built upon basic facts and past experience of the industry. Factual industry statistics are the basis for measurement of the industry and are essential to the success of every individual member's business.

Statistical Surveys

Our ability to determine and quote attractive, yet safe, prices for our services, depends upon the combined experience of our competitors as a group, more than upon the results of our own endeavors. We must have accurate information on installation costs, overhead ex-

penses, distribution conditions and available markets, in order to exercise intelligent judgment in solving our daily problems.

Through its Statistical Committee, N.E.C.A. is gathering up-to-date data showing the volume of our business in the various fields we survey, the geographical distribution of that business, and the products we handle in connection therewith. These are important factors which materially affect the relations of the contractor with the distributors, manufacturers and utilities.

Factual industry statistics determine the importance of the electrical contractors to their industries and demonstrate its service to the public. It is in the interests and welfare of every member of our industry for the Association's statistical files to be accurate and complete, to enable N.E.C.A. members to chart a more successful course for their business, and to furnish facts upon which to build sound constructive federal and state laws.

Codes and Standards

Responsibility to the public, regardless of any benefits to the electrical industry, demands that the electrical contractors give consideration to the reduction of the cost of electrical installations, by the elimination of the multiplicity of needless wiring materials and methods. This can be accomplished by simplification and standardization of materials, and by the establishment of uniform wiring practices.

A competent committee, the N.E.C.A. Codes and Standards Committee, has been engaged in the development of recommended standards of wiring materials and practices, and the elimination of needless variations of types of materials through simplification and standardization. These standards are to be issued in an appropriate form for distribution to all architects, consulting engineers, federal and state engineering departments, and all other interested engineering agencies for their guidance in designing electrical installations and specifying materials to be used therein.

Public acceptance of the services of the electrical industry demands public confidence that the industry is seeking to provide the highest development of the service at the lowest possible cost. This general benefit activity of N.E.C.A. is a service which should greatly benefit the entire electrical industry.

Estimating and Cost Data

No general benefit activity of N.E.C.A. has performed a greater service to a greater number of electrical contractors than the development of the Manual of Labor Units over the past twenty years. Started in 1920, its greatest progress, however, has been made during the past few years under a most competent committee, whose chairman, George W. Patterson, of Toronto, in 1937 received the McGraw Award for his outstanding contributions to the industry in the development of this manual.

Accurate estimating is possible; it requires only that all apparatus, equipment, materials and other parts of the work shall be segregated in detail and to each shall be applied a definite cost unit for purchasing and a dependable cost unit for installation.

Definite cost units for purchasing are already obtainable from our materials suppliers, but the cost units for installation can be dependable only when established by broad experience in the field. Such cost units for installation, usually referred to as labor units, to be reliable must be established by actual field surveys and labor cost records made over a period of many years and under all kinds of conditions and circumstances.

N.E.C.A. has expended enormous sums of money over many years to carry on important work of establishing the thousands of dependable labor units necessary to estimate the multiplicity of kinds of electrical installations available, and which are now embodied in the N.E.C.A. Manual of Labor Units. This manual is the most accurate and most complete data for estimating purposes ever published by any branch of the construction industry.

Legislation and Procedures

The average electrical contractor recognizes legislation only when it directly affects him after the legislation has been enacted and its influence already established. Because of his feeling of helplessness as a result of his standing alone without the combined experience and support of his fellow contractors, he gives little attention to discriminatory legislation that may be proposed and the details of which he seldom learns until after they have been enacted into law.

Obviously, the individual electrical contractor *alone* can do very little, if anything, to effectively oppose discriminatory legislation, and even less to propose beneficial legislation. These are matters in which he needs the *organized assistance* of his fellow contractors—his competitors. I stress the organized assistance, which means action through strong local and national associations. These associations must have active and alert legislative committees to follow all proposed legislation, and to advocate and support beneficial legislation, which often requires the calling in of competent legal talent. Regardless of how independent and isolated an electrical contractor may want to be, this is one very important phase of his business in which he must have the assistance and cooperation of his competitors to protect his interests.

The National Electrical Contractors Association, through its Legislative Committee and through its general counsel, located in Washington, is following and opposing all discriminatory legislation; it is advocating and supporting beneficial legislation; and it is watching the interests of N.E.C.A. members in all matters of governmental procedure which affects the electrical contractors, with recommendations for action to be taken.

Prompt Action Possible

The recent prompt and strong action taken by N.E.C.A., in correcting the confusion that was developing in the procedure of the government in negotiating for national defense construction projects on a cost-plus-a-fixed-fee basis, without due recognition of the services of the highly specialized contractors, is an example of the need for a strong national association ready to meet such an emergency. The confusion as to who is to perform the specialized work, including the electrical installations, in this national defense program, has been clarified, and a number of sub-contracts have already been obtained by electrical contractors for substantial amounts of the work that the Federal Government has awarded on a cost-plus-a-fixed-fee basis.

This general benefit activity is one of N.E.C.A.'s fundamental services and no electrical contractor can afford to be without it—it is not available elsewhere. Increasing activities of the Federal Gov-

(*Continued on page* 79)

Southern Contractors Participate in Association Activities

BRIEF biographical sketches are presented here on several of the contractors who have served the National Electrical Contractors Association in some official capacity. Among these are Joseph A. Fowler, of Memphis, executive committeeman for more than fifteen years and president from 1925 to 1927; Ralph M. Walker, of Atlanta, executive committeeman for several years and vice president from 1937 to 1939; D. C. Clayton, of Birmingham, executive committeeman for many years, chairman of numerous committees, and now chairman of the important Sales Development Committee; W. W. Ingalls, of Miami, executive committeeman for nearly ten years and a member of the N.R.A. Electrical Contractors Code Authority in 1934 and 1935; Herman A. Hood, of Houston, executive committeeman for several years for the southwestern division; Eugene Ashe, of Fort Worth and Houston, who recently succeeded Mr. Hood as executive committeeman for that division; and Russell L. Jacobe, of Houston, who served as a member of the N.R.A. Electrical Contractors Code Authority.

But the honor roll of electrical contractors from the South who have contributed to the upbuilding of the Contractors Association would not be complete without the names of scores of men whose work has been done quietly and consistently without bringing them into the limelight as office holders or committeemen—such men as Ralph Bouligny, of Charlotte; T. W. Wilmer, of Richmond; J. M. Richardson, of Roanoke; K. D. White, of Atlanta; and many others.

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D. B. Clayton

Birmingham, Alabama

One of the best informed men in the southern electrical industries, and one of the most constructive builders of their destiny, D. B. Clayton, president of Electrical Contractors, Inc., 2023 4th Ave. N., in Birmingham, Alabama, founded his position in the industry on a firm basis of knowledge and experience in the field.

Graduated in electrical engineering from Clemson College, in 1910, Mr. Clayton joined the Westinghouse Electric & Manufacturing Company's apprentice course in 1911, and entered its sales branch in Atlanta in 1914. After two years he joined the Piedmont Electric Company, of Asheville, N. C., and returned to Birmingham in 1917 to join the Matthews Electric Company, a wholesale firm.

A thorough knowledge of construction problems in electrical work was gained through work with the Tennessee Coal, Iron and R.R. Company in the construction of its Fairfield unit, and in 1919 Mr. Clayton organized the Mill & Mine Construction Company, specializing in industrial work throughout the South. This concern operated until January, 1936, when Mr. Clayton bought an interest in the Knight Electric Company, of Birmingham.

In May, 1939 he organized Electrical Constructors, Inc., to handle work for the Ingalls Shipbuilding Corporation, in Pascagoula, Mississippi, and other Mississippi contracts, with the Knight company handling all Alabama contracts.

Mr. Clayton has been a member of the N.E.C.A. executive committee since 1931, and was secretary of the Jefferson County Chapter of the national association since its organization in 1926. He is also a member of the national code committee, of the regional committee of the Southeast, covering eight states, and of the articles committee of the N.F.P.A. When the N.E.C.A. instituted its national sales development committee to work out a national sales manual, Mr. Clayton was chosen to head it. He is also a member of the publication committee of *Qualified Contractor*.

Mr. Clayton has taken considerable interest in the apprentice phase of the electrical industries, and has been instrumental in developing this trend in Birmingham, and keeping it on a par with the trade's developments.

○

Joseph A. Fowler

Memphis, Tennessee

Joseph A. Fowler, Fowler Electric Company, of Memphis, Tennessee, was born in Memphis on October 6, 1883. He attended the local public schools, and acquired the foundation of his electrical career through a course in Electrical Engineering from a well-known correspondence school. In 1911 he was married, and now has two children, a girl and a boy.

From 1925 to 1927, Mr. Fowler was president of the National Electrical Contractors Association. He was president of the local Electrical League in 1935, 1936, and 1937. He was secretary of the State Electrical Contractors' Association from 1920 to 1937. Civic activities have not been neglected, however, in his busy career within the industry, for he has found time to serve as president of the local Rotary Club,

and as a member of the Masons and Shrine. Also, for a time, he was a director of the Memphis Chamber of Commerce.

His firm was organized in 1910, privately owned, just "Joseph Fowler doing business as the Fowler Electric Company." It is still that way, unincorporated, owned and headed by Mr. Fowler. Until a year ago, it was one of the area's outstanding retail electrical firms; then it became a strictly wholesale firm.

At present, Mr. Fowler is executive director of the Memphis Housing Authority.

●

Herman A. Hood

Houston, Texas

One of the most active of Texas contractors in National Association affairs is Herman A. Hood, of Houston, Texas, who served as executive committeeman for the Southwest district for several years as well as in other organization work.

Now a highly competent electrical contractor, his colorful career has touched upon a wide range of activities. Born in 1889 in the Indian Territory in Chickasha, Oklahoma, Mr. Hood was educated in Houston grammar schools, high school in Waco, and was graduated in civil engineering from the famous old Add-Rann College in Thorpe Spring, Texas, the school which fathered Texas Christian University.

During his early life, Mr. Hood followed many fields of endeavor, which took him to many places in the western hemisphere. A year of railroad construction was followed by three years of surveying. His next jump was to San Domingo to superintend the hauling of lumber out of the mountains. While there, he installed an extensive communications system, including telephone and telegraph wires up into the mountain settlements, using native labor. Back to Waco, Texas, in 1909, he joined the construction department of the local telephone company, and later undertook the same work for the local utility.

World War No. 1 took Herman Hood along in the air service, and he was "hot-shotted" to various parts of the country to train aviation mechanics. When the show was over, he went back to Waco for the purpose of acquiring a bride. A plant construction job took him to Fort Worth, where he shortly became an electrical inspector, later joining a firm and undertaking local electrical contracting work.

In the early '30s, Hood returned to Houston, became foreman of the Hulburt Still Electric Company, later forming his own company in 1933. He specializes in commercial and industrial contracting work, with emphasis on contracts under $20,000.

●

Ralph M. Walker

Atlanta, Georgia

Although Ralph M. Walker has not been a member of the National Electrical Contractors Association since July, 1939, when the Walker Electric Company discontinued active participation in the electrical contracting business, he played an important part in the upbuilding of the national association.

Mr. Walker first because associated with the National Electrical Contractors Association some 25 years ago. He was active on various committees and in 1936 was elected executive committeeman from the Southeastern Division. In 1937, he was elected vice president of the association, which position he held until his resignation in July 1939.

One of the high points of Mr. Walker's many years in the Association occurred at the last annual convention in November, 1939, when he received the James H. McGraw Award and Contractor-Dealer Medal for the "most constructive contribution to the advancement of the contracting branch of the electrical industry for 1939." In the citation that accompanied this award, it was pointed out that Mr. Walker had devoted himself to the study of trade policy experience and of common-sense self-government among electrical men, based on self-discipline, in order that frictions and conflicts in the inter-relations between them might be relieved and avoided. He became chairman of the association's trade policy committee and developed a "Code of Buying Ethics" for electrical contractors, that offered them a practical guide in their relations with electrical wholesalers, manufacturers and power companies. In the citation he was termed "the outstanding champion of fair trade policy in the electrical industry."

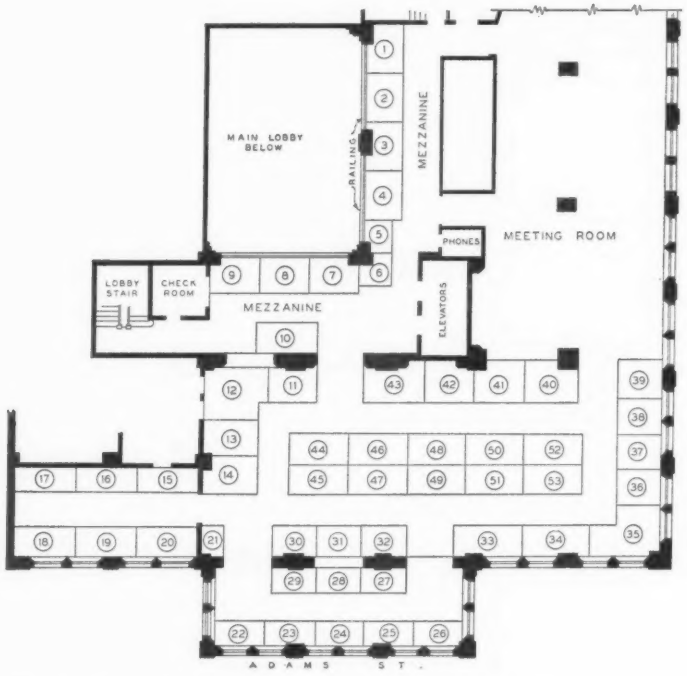
Mr. Walker was born in Chicago. His first contact with the electrical industry came with his employment by the Commonwealth Edison Company. Much of his technical education he obtained by working at night and attending classes during the day. After nearly ten years with Commonwealth Edison, he joined the Buckeye Lamp Works. Reaching a decision to go into business for himself, he moved to Alabama and bought an interest in a Selma electrical contracting firm.

Within a short time, Mr. Walker disposed of his interests in the Selma business and established an electrical contracting business in Rome, Georgia, which later became known as the Walker Electric and Plumbing Co. As business improved, a branch was opened in Columbus, Ga., and in 1916 he moved the headquarters of the firm to Atlanta. Later, the plumbing business was liquidated and the Rome branch was closed.

(*Continued on page* 44)

Electrical Products on Display

Nearly fifty manufacturers will exhibit their equipment in the display room booths at the George Washington Hotel during the N.E.C.A. convention, October 21st to 23rd.



Floor plan of exhibit area showing booth arrangement.

1. Consultation Booth
2. Walker Electric Company
3. and 4. Westinghouse Electric & Mfg. Co.
5. and 6. Electrical South Magazine
7. Wadsworth Electric Mfg. Co.
8. Anaconda Wire & Cable Co.
9. Registration Booth—Stenographer.
10. Jefferson Electric Co.
11. Benjamin Electric Mfg. Co.
12. and 13. American Coolair Corp.
13. and 14. Hygrade Sylvania Corp.
15. Crown Stove Works
16. United States Rubber Co.
17. Jacksonville Chapter, N.E.C.A.
18. Republic Steel Corp.
19. National Transformer Corp.
20. Wurdack Electric Mfg. Co.
21. Silver Springs, Fla., Exhibit
22. Fresh'nd Air Co.
23. Allied Metal & Stamping Co., Inc.
24. Shepler Stove Co.
24. Martin Stamping & Stove Co.
25. Columbia Cable & Electric Co.
25. U. S. Expansion Bolt Co.
26. Midwest Electric Mfg. Co.
26. Triangle Conduit & Cable Co.
27. Automatic Electric Heater Co., Inc.
28. Ernest G. Romeiser
29. Harvey Hubbell, Inc.
30. and 31. Allen Bradley Co.
31. and 32. Sangamo Electric Co.
33. Frank Adam Electric Co.
34. C. C. Schoen
35. Gill Glass & Fixture Co.
36. and 37. W. H. Berry, Jr.
38. Edwin L. Wiegand
39. Holfast Rubber Co.
40. Ernest T. Loyd
41. Square D Co.
42. Appleton Electric Co.
43. Youngstown Sheet & Tube
44. Bryant Electric Co.
45. Armored Cable Section, N.E.M.A.
46. Bussmann Manufacturing Co.
47. E. B. Glenn
48. General Electric Co.
49. Trumbull Electric Mfg. Co.
50. and 51. National Electric Products Corp.
52. H. C. Biglin
53. Edgar E. Dawes

Commercial Cooking Council Analyzes Sales Activities

AN annual survey of sales progress in commercial cooking equipment, which is the fourteenth conducted among utility companies, has just been completed by the Commercial Electric Cooking Council sponsored by the Edison Electric Institute. A study of the results, which includes information from 131 electric service companies, is convincing evidence of the profit possibilities from this type of load building equipment.

The accompanying table summarizes the replies and there is below an analysis of these figures as well as some comparisons with the 1938 survey. It should be pointed out that while the comparison with 1938 is an interesting guide, it is not an exact comparison because it does not include the same companies in the two years under consideration.

For the purpose of analysis, the report is divided into two parts. Part I includes data on total commercial customers, number of food-serving establishments, kilowatts sold, estimated kilowatt-hours, estimated annual revenue and estimated increase in annual revenue. Part II includes data on salesmen, wiring policy, equipment financing, equipment servicing, and future sales plans.

To present a more composite cross-section, Part 1 is broken down into two sections, one a brief summary of all replies to each question, and the other a complete analysis of those 76 companies which have answered all questions in this group. The objective is a more accurate picture which can be obtained from an analysis of these complete replies, especially where calculations are made from summaries of related and dependent questions.

The "average company" served 27442 commercial customers of which 1,623 were food serving establishments. This "company" sold 875 kilowatts of commercial electric cooking equipment which will use 974,127 kilowatt-hours a year and bring in an E.A.R. (estimated annual revenue) of $21,283. This was an increase of $2,621 over the annual revenue from equipment sold in the previous year.

Personnel and Their Activities

Eight companies reported the use of full-time commercial cooking salesmen only, nineteen companies reported the use of full-time and part-time salesmen, ninety-six companies reported the use of only part-time salesmen, and seven companies report that they have no salesmen contacting the commercial cooking field. In the companies that use full-time salesmen for the promotion of this type of business, these specialists averaged $8,096 in E.A.R. per man per year. This was equivalent to an average of $21,252 per company. The seven companies that reported they did not have salesmen covering this field did a certain amount of business in commercial electric cooking equipment through purchase by the customers upon their own initiative. These companies averaged only $1,510 in E.A.R. per company through these unsolicited sales. It appears that the use of one full-time salesman, or even a part-time salesman, would be well within the budgeted development expense in view of the high E.A.R. derived from this business. Other activities of part-time salesmen are reported in the summary. These part-time men devote on the average 20% of their time to the development of the commercial electric cooking load.

Since the Council program is designed to promote the sale and

(*Continued on page* 44)

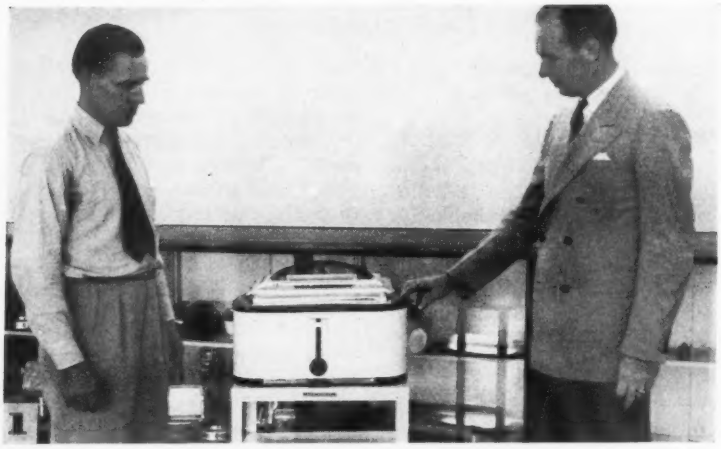
Summary of Surveys of Commercial Electric Cooking Sales Activities
(Total of All Replies)

1939		1938
2,511.096 (129 companies)	Total number of electric customers served (excluding domestic, municipal and utilities)	2,178,521 (123 companies)
130,927 (112 companies)	Approximate number of food serving establishments in territory served	131,363 (114 companies)
79,666 (93 companies)	Kilowatts of commercial electric cooking equipment sold	65,101 (125 companies)
82,143,539 (92 companies)	Estimated kilowatt-hours to be used annually by this equipment	70,628,113 (121 companies)
$1,911,449 (93 companies)	Estimated annual revenue from this equipment	$1,579,401 (123 companies)
$ 224,517 (85 companies	Net increase in revenue over previous year	$ 156,245 (112 companies)

(Complete Replies—76 Companies)

Total number of electric customers served, excluding domestic, municipal and utilities	2,085,625
Approximate number of food serving establishments in territory served	123,366
Per cent of food serving establishments to total number of customers shown above	5.91%
Kilowatts of commercial electric cooking equipment sold	66,554
Watts sold per food serving establishment (average)	531
Estimated annual kilowatt-hours used by this equipment	74,033,717
Estimated annual kilowatt-hour use per kilowatt connected	1,127
Estimated annual revenue from this equipment	$1,625,121
Estimated annual revenue per kilowatt connected	$24.42
Net increase in revenue over previous year	$209,266

USE-VALUE STRESSED



"It stops 'em with eye appeal!"

"Oven roasts a meal for ten persons!"

"Paint a word picture of a crisp brown turkey!"

LOWER priced major appliances, smaller margins, and keen competition, all indicate that the successful appliance dealer must not overlook a single profit opportunity. Small appliances generally, and electrical roasters in particular, offer the dealer a splendid opportunity to broaden his sales horizon.

In the accompanying photos, we present some of the highlights of roaster sales technique as developed by J. V. Clement, of the merchandise division of the Miami branch of Westinghouse Electric Supply Company.

Mr. Clement has had a wide range of merchandising experience and an enviable selling record in the electrical appliance field. Before being transferred to the Miami branch last October, he covered the company's dealer accounts in South Carolina for two years. He also has represented electrical wholesalers in Metropolitan New York and in the Mid West.

"Electrical appliance dealers," says Mr. Clement, "who fail to promote small appliances as vigorously as they do major items, are letting an important part of their potential profits slip through their fingers. A small appliance display, representing an investment of a few hundred dollars and occupying less than ten square feet of store space, easily can produce a dozen turnovers per year and bite a large chunk out of the dealer's overhead.

"The new-type electric roasters, for example, offer volume-building opportunities which no enterprising dealer can afford to overlook. Streamlined, they have plenty of 'eye appeal.' And their multi-purpose features provide ample background for selling 'use-value.'

"Depending on its capacity, an electric roaster will cook a complete meal for six to ten persons. Yet it competes little if any with range sales. While a range owner often buys a roaster as additional cooking equipment, the smaller appliance has a distinct clientele of its own.

"Because it is portable and can be plugged in at any 110-115 volt outlet, a roaster readily should sell to prospects who own or rent hunt-

IN ROASTER SELLING

ing camps or summer homes, or to those who plan long overland automobile trips. More often than not an electric roaster proves mighty handy in the less expensive quarters available in winter vacation spots.

"Having a cubic capacity of approximately one-third that of a range, a roaster has a particular appeal to owners of 'efficiency' apartment houses and to purchasers of the small, low-cost homes now being sponsored by the Federal Housing Administration. Add to this class of 'prospects' young married couples, who eat only a part of their meals at home. For these a roaster with broiler-grid and a few table appliances makes an ideal culinary setup. The special cabinets or tables available with many models contribute greatly to the convenience for such use.

"Since an electric roaster holds its heat, like a thermos container, for several hours after the current is turned off, a meal may be cooked in it and taken elsewhere to be eaten. This feature extends the use of the appliances to picnics, church or lodge suppers and a holiday visit to the 'old folks.'

"These suggestions scratch only the surface of the varied uses to which an electric roaster can be put. Any dealer can think of many others, some of them particularly adaptable to the domestic and social life in his own community.

"Well-planned newspaper and direct-by-mail advertising, interior and window displays, can be depended upon to build up store traffic and, as a result, roaster sales. Promotional publicity will be most effective, of course, when constructed around the benefits the customer derives from the purchase of the article publicized. In promoting

(*Continued on page* 80)

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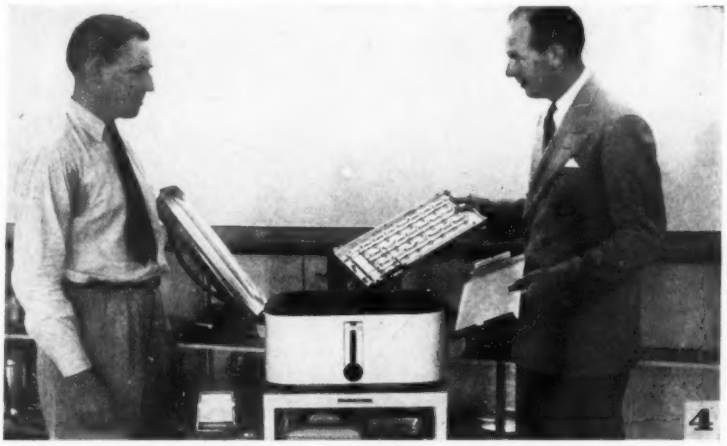
In the photographs, demonstrating roaster sale technique, are J. V. Clement, right, merchandise salesman with Westinghouse Electric Supply Co., Miami, and L. D. Kent, left, manager of Page Electric Co., Miami.



"Or a thick juicy sirloin!"

"Take it with you on auto trips!"

"Thanks! From now on I'll push roasters!"

Dealer Problems Studied in Merchandising Survey

THE fact that a substantial number of independent exclusive appliance dealers in the South still are able to operate at a profit is disclosed by ELECTRICAL SOUTH'S 1940 survey of electrical appliance merchandising practice, in spite of a pessimistic belief in some quarters that the day of the independent dealer is passed. These successful dealers are carrying full lines, taking advantage of every profit possibility; they maintain efficient service organizations and adequate sales staffs; and they are participating in increasing numbers in national promotions such as campaigns of the modern Kitchen Bureau and National Washer-Ironer Week.

Although most appliance dealers report substantial sales increases for 1940 over 1939, they still find the trade faced with a number of serious problems. Reduced list prices and lower margins are making it difficult to train and maintain competent sales organizations; a large number of retail outlets in every community is still making it difficult to obtain satisfactory volume; and the absence of established retail prices in many areas is resulting in cut-throat competition.

The results of ELECTRICAL SOUTH'S survey, discussed in more detail in the following paragraphs, are based on replies received from comprehensive questionnaires mailed out to 1,500 appliance dealers throughout the 16 southern states from Maryland to Texas.

Utility Policies Studied

Data pertaining to electric utility company activities in the appliance field were obtained from 46 major companies serving a total of 63 per cent of all domestic customers in the South. These 46 companies represent practically every company serving more than 10,000 domestic customers.

The dealer questionnaires were mailed to dealers selected at random from the ELECTRICAL SOUTH subscription list. An effort was made to keep the number of questionnaires mailed in each state somewhat proportional to the number of retail outlets in that state. Also, the list included appliance dealers of various classifications: independent exclusive appliance dealers, combination electrical contractor-dealers, hardware dealers, furniture store dealers, department store dealers, and a miscellaneous group including music stores, filling stations, etc.

In examining the results of this survey, consideration must be given to the fact that voluntary replies are more easily obtained from the larger dealers and that the averages obtained, therefore, represent a cross section of the more substantial dealers rather than an average for the trade as a whole such as would be obtained from a complete census or a scientific sampling.

The average appliance sales volume reported by all dealers for the year 1939 was $63,900. The average of the anticipated sales volume for 1940, based on sales during the first half of the year, was $72,900, representing an increase in sales over 1939 of about 14 per cent.

Department stores and furniture stores reported the largest sales increases for 1940, this group expecting 1940 sales to top those of 1939 by 26 per cent. Exclusive appliance dealers and electrical contractor-dealers together reported increased sales for 1940 at 11.1 per cent.

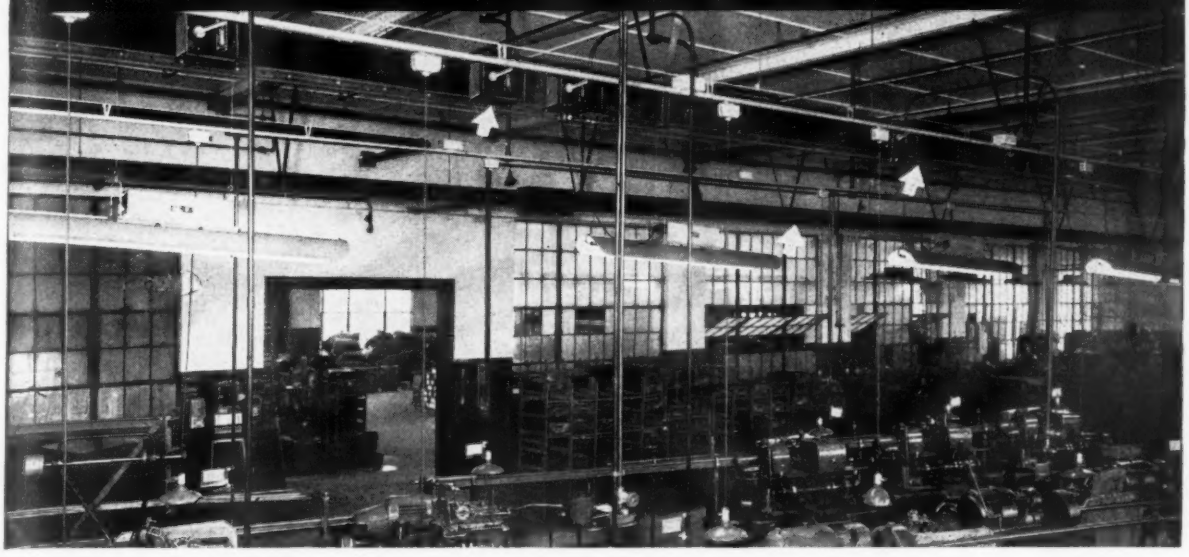
Gross Margin Decreases

Because of the difficulty in obtaining accurate figures on overhead from dealerships combined with other types of business such as furniture stores, department stores, and electrical contractor-dealers, no effort was made to obtain this information except from exclusive appliance dealers. For this group, the average overhead cost for the year 1939, in per cent of gross sales, was 26.4 per cent. This same group of dealers reported an average margin of 31.6 per cent of gross sales, leaving an apparent spread between overhead and gross margin of 5.2 per cent.

In a similar survey conducted last year, independent appliance dealers reported gross margin of 34.0 per cent of gross sales; over-

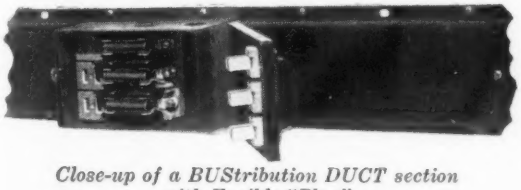
"Action" is a fundamental requirement for good display. An unusual means of attaining it was used in this home laundry equipment display of the Peoples Furniture Store, Richmond. The display was enlivened by periodic appearances of an attractive young lady who reads, listens to the radio, and demonstrates the home laundry equipment.

The derating of the larger size Cables under the new Code gives further emphasis to the advantages of **BULL DOG "Plug-in" BUSTRIBUTION DUCT**



An Industrial Installation having BUStribution DUCT for flexible power circuits and Universal Trol-E-Duct supporting and feeding fluorescent units for flexible lighting.

BULL DOG BUSTRIBUTION DUCT — the Modern Enclosed Busbar System of flexible electrical distribution should now prove more popular than ever and you will want to learn more about this flexible, convenient and economical system that is rapidly replacing old-fashioned methods of electrical distribution.



Close-up of a BUStribution DUCT section with Fusible "Plug"

A new 48 page Bulletin (No. 403) entitled — FLEXIBLE LIGHT AND POWER CIRCUITS FOR INDUSTRIAL PLANTS AND COMMERCIAL BUILDINGS — has just been received from our printer. It is full of interesting illustrations with complete engineering information regarding Lay-outs, Methods of Estimating, Symbols for Estimators, etc., etc.

Write for copies of Bulletins 403 and 386 on BUStribution SYSTEMS for flexible Light and Power Circuits

BULL DOG ELECTRIC PRODUCTS CO.

Originators of Flexible Electrical Distribution Systems

DETROIT, MICHIGAN

MANUFACTURERS OF Vacu-Break Safety Switches, Panelboards, Switchboards, Duct Systems — FOR LIGHT & POWER

Although radios were the principal items of interest in this display, eye-catching action was added by the addition of several exhaust fans. One fan in the dummy window was equipped with paper streamers to show the direction of air flow. The display appeared in the windows of Fakes & Co., Fort Worth.

head cost of 28.5 per cent of gross sales; and an apparent spread between overhead and gross margin of 5.5 per cent.

The apparent spread between gross margin and overhead cost cannot be accepted at its face value because of the varying practice among dealers in their method of handling losses sustained in connection with the resale of merchandise accepted in trade.

The average appliance stock carried by reporting dealers was $8,950. This average was raised considerably by the large stocks of department stores. For individual groups, the average values of appliance stocks were as follows: independent appliance dealers, $6,800; contractor-dealers, $4,430; and hardware dealers, $1,150. For all dealers, the average anticipated sales for 1940 will represent a stock turn of about 5.3 times per year. Department stores reported the smallest stock turn, 3.4 times. For other groups it was: exclusive appliance dealers, 6.5 times; hardware dealers, 5.0 times; and contractor-dealers, 3.8 times.

The survey indicates an increasing trend of dealers toward directing their sales efforts on complete lines of household appliances rather than specializing in one or two particular appliances. In the following tabulation is given a list of the more popular appliances and a percentage of replies indicating that these appliances are being stocked and sold. The first column indicates the percentages of all reporting dealers handling that particular appliance, while the second column shows the percentage of exclusive appliance dealers handling such an appliance. In this connection, it is especially interesting to note that practically every exclusive appliance dealer is handling refrigerators, ranges, washing machines and radios and that an increasing number are handling water heaters, dishwashers, stokers and oil burners.

Refrigerators	93%	100%
Ranges	90%	93%
Washing Machines	90%	98%
Radios	90%	95%
Vacuum Cleaners	78%	83%
Small Appliances	77%	75%
Ironers	72%	83%
Water Heaters	70%	76%
Lamps	65%	50%
Attic Fans	46%	39%
Air Conditioners	44%	50%
Dishwashers	38%	61%
Water Systems	32%	25%
Stokers-Oil Burners	27%	42%

In the case of combination electrical contractor-dealers, 75 per cent reported that they were pushing attic fans, 47 per cent air conditioners, and 47 per cent water systems. While the contractor-dealers tended more to specializing in one or two appliances, a much larger number handled those appliances that required some wiring installation along with the appliance.

Dealers were also asked to report their most profitable appliances. By far, the largest number reported the electrical refrigerator as the most profitable. Taking the number of dealers reporting the refrigerator as the most profitable appliance as 100 per cent, the following tabulation shows the percentages which reported other appliances as one of their most profitable.

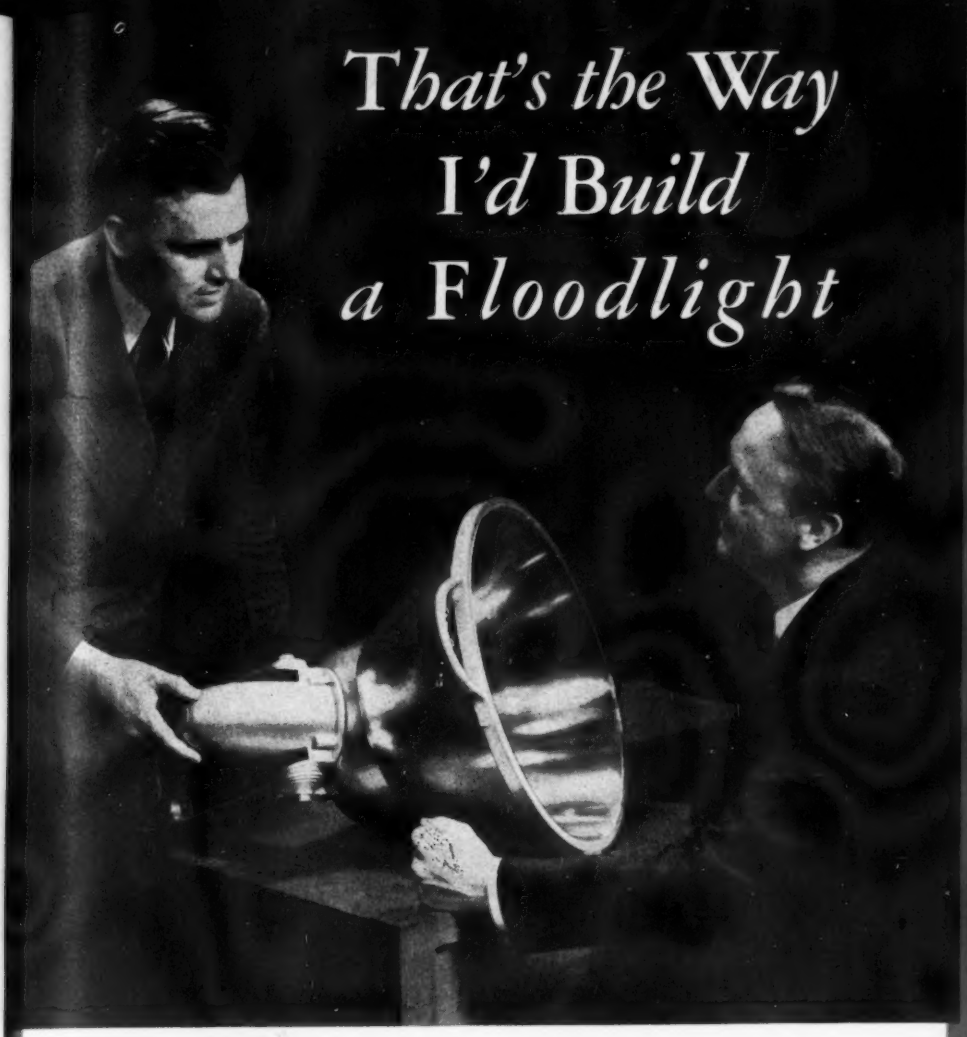
Refrigerator	100%
Range	62%
Washing Machine	54%
Radio	52%
Water Heater	17%
Small Appliances	15%
Stokers-Oil Burners	14%

Appliance dealers not handling stokers and oil burners would do well to note that this appliance was included as one of the seven most profitable of all. This is especially interesting inasmuch as only 27 per cent of the dealers replying to the questionnaire were stocking stokers or oil burners.

Appliance dealers appear to be

Spaciousness in a display room lends dignity and attractiveness to major appliances. There is no sense of crowding in this display room of Boegli's, in Wilmington, N. C.

That's the Way I'd Build a Floodlight



G-E Floodlights Are Built from the Buyer's Viewpoint

IF THE man who buys floodlights could draw up a set of specifications to best fulfill his requirements, you would find that General Electric floodlights meet those specifications completely.

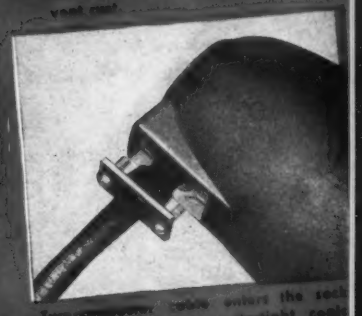
For example, only in the G-E Type L-68 floodlight can you obtain the three features that make servicing easier—a 240-degree tip-over to raise the floodlight to servicing position, a repositioning stop for returning the unit quickly to the lighting position, and a slide-type door glass for easy removal and less breakage. These features have proved their worth on many installations—yet they cost you nothing extra.

Recommend G-E *Alzak aluminum floodlights on your next job—you'll find them easier to sell because, in addition to the trim appearance and high efficiency, these floodlights have many other extra-value features. You'll find installation easier, too—and profits larger. For complete floodlighting equipment or recommendations call the nearest G-E Office. General Electric, Schenectady, N. Y.

*Manufactured under Aluminum Company of America Patents

Rear section of reflector is extruded to provide a flat metal-to-metal [illegible] between socket housing and reflector. Keyhole slots provide quick removal of the reflector for either replacement [illegible]

The one-piece socket housing will not allow water to enter and drip on the lamp. Constructed of die-cast aluminum, it does not require periodic painting to prevent rust.



Two-conductor cable enters the socket housing through a watertight cable rubber bushing. Strain on binding-post screws and wearing of cable insulation are eliminated.

Resetting ring makes relamping and servicing simple. The special repositioning stop assures that the floodlight returns to its proper position.

Continuous 180-degree tilt in base and crossarm bracket assures that crossarms will be drilled alike. Holding and positioning bolt on different levels aid in installation.

GENERAL ELECTRIC

451-13

...HOTPOINT'S Great

is a LANDSLIDE

CHOICE OF ALL PARTIES
Hotpoint Electric Ranges
THRIFT COOKER
ALL PURPOSE OVEN
5 MEASURED HEATS
Hotpoint's Winning PLATFORM
PRIVATE INITIATIVE IN PLANNING DELICIOUS MEALS
SOCIAL SECURITY FOR MODERN HOMEMAKERS
ECONOMY IN THE HOUSEHOLD BUDGET
NO ENTANGLEMENTS IN MEAL PREPARATION
Hotpoint's Winning PLATFORM
PERSONAL LIBERTY IN THE KITCHEN
LOWER TAXATION ON FAMILY INCOME
ADEQUATE DEFENCE AGAINST WORK AND WORRY
PREPAREDNESS FOR UNEXPECTED GUESTS

SPEED UP FLOOR TRAFFIC WITH THIS NOVEL WINDOW DISPLAY

This sensational window display, which features the New President Range in the Fall Presidential Campaign, has been a smashing success. It has eye appeal and tells a complete story of the Hotpoint President Range by capitalizing on the tremendous public interest in the coming presidential election. Use this great window display to build your floor traffic. See your distributor now, TODAY!

Pull Live Prospects to Your Store with This Hotpoint Menu-Maker

A novelty of great interest to homemakers. Actually plans complete meals by a twist of the dial. Simple, easy to use, almost automatic. Builds floor traffic for you. Get details about this great sales stimulator from your distributor.

a Presidential Campaign

E FOR RETAILERS!

Proves Most Successful Range Campaign in Hotpoint History

Orders Pouring in for *President Range*

THE demand is overwhelming—and no wonder! The President Range is the most popular candidate for the American Housewife's kitchen. And the Presidential Campaign is the liveliest ever to come from a long line of successful promotions. National advertising in leading national publications—*Saturday Evening Post*—*Collier's*—*Life*—*American Home*—*Better Homes and Gardens*—*Good Housekeeping*—*Ladies' Home Journal*—*McCall's*—*House Beautiful*—*Bride's*—*Electricity on the Farm*—featuring Hotpoint's New President Electric Range.

New Presidential Direct Mail material, Store Displays, Election Banners, and Newspaper Campaign tied in with the Election Theme. Sound Movie "Blame It On Love" with new plan for exploiting this powerful sales medium. And there's a special Sales Promotion Package Deal containing material for an active campaign.

Retailers Everywhere Report Big Gains!

There Is Still Time to Cash In on This Great Promotion

Word is flashing in from every corner of every state in the Union—sales are rising—profits are bigger—the Presidential Campaign is a whooperdoo!

Don't fail to get in on this great success! The time is ripe and so is the market. Get your share of this business. Get in touch with your distributor today. Now! Tomorrow may be too late. Edison General Electric Appliance Co., Inc., 5614 West Taylor Street, Chicago, Illinois.

NEW FRIENDLY FINANCE PLAN MAKES BUYING AND SELLING EASIER

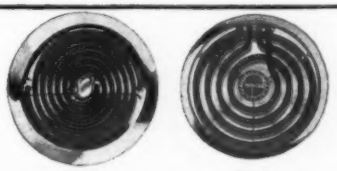
What's Right—Not Who's Right!

On the wall of my office hangs a sign which reads "What's Right—Not Who's Right."

This principle has guided the thinking of our company over the years. Translated into a rule of conduct, it means "seek the truth from the public; from the trade; from field and factory research. Be guided by facts so that the products we build, the sales policy we follow, the services we offer are basically right—and not the opinion of one individual."

"What's Right—Not Who's Right" will continue to be the Hotpoint policy.

Vice-President



OLD NEW

YOU CAN SEE THE DIFFERENCE

NEW CALROD cooking units are faster, more efficient, more economical than ever. Reduced coil length in the new Calrod provides faster heating; coils are self-cleaning.

Hotpoint ELECTRIC RANGES

REFRIGERATORS · WATER HEATERS · WASHERS · IRONERS
CLOTHES DRYERS · DISHWASHERS · ELECTRASINK

about evenly divided on the question as to whether they consider the present number of models and price ranges on major appliances as satisfactory. Forty-seven per cent of all dealers replying were satisfied with the present number of models and price ranges. The other 53 per cent were of the opinion that there were too many models in most appliance lines. Those who favored a smaller number of models felt that the present large number of sizes and models was confusing to customers, and that the average customer's requirements could be served satisfactorily from a much smaller line. Their reasons for favoring a reduction in the number of sizes and models were that generally decreased overhead would result, a smaller investment on the dealer's part would be required, more frequent turnover in investment could be accomplished, complete display would require smaller floor space, and service department expenses would be decreased. Several dealers reported that they had received word from their manufacturers that 1941 lines would include a smaller number of models.

One Line for Most Dealers

An investigation of the tendency of dealers to specialize in a single line rather than carry the line of several manufacturers, disclosed that approximately 70 per cent of all reporting dealers handled only a single brand of appliance. This did not mean that a dealer might not handle ranges of one manufacturer and washers of another, etc., but that 70 per cent carried only a single brand of any specific appliance. Approximately 25 per cent of all dealers reporting carried two brands in major appliances, and the remaining 5 per cent carried three or more brands in each major appliance. The following tabulation gives the exact percentages for each of four major appliances.

	One Brand	Two Brands	3 or More Brands
Range	69%	23%	8%
Water Heater	75%	23%	2%
Refrigerator	71%	25%	4%
Washer	63%	27%	10%

Among the different classes of dealers, the matter of carrying several lines in a specific appliance appeared to be one of personal choice and was not more common in one class of dealers than in another. One exception to this, however, was the department store group in which nearly 50 per cent carried two or more brands of all major appliances investigated in the survey.

This unusual window display served to promote interest in electric coffee makers. The extreme competition in the major appliance field makes the profitable small appliance business particularly desirable.

The general operating methods of appliance dealers were discussed in one group of questions. The average number of full time, outside salesmen reported by all dealers was three, but many dealers indicated that part-time men were added to the staff during the busy seasons of the year. Department stores, as a group, employed the largest number of outside salesmen which was six per store. Exclusive appliance dealers averaged three, and other groups such as contractor-dealers and hardware dealers averaged from one to two full time salesmen per store.

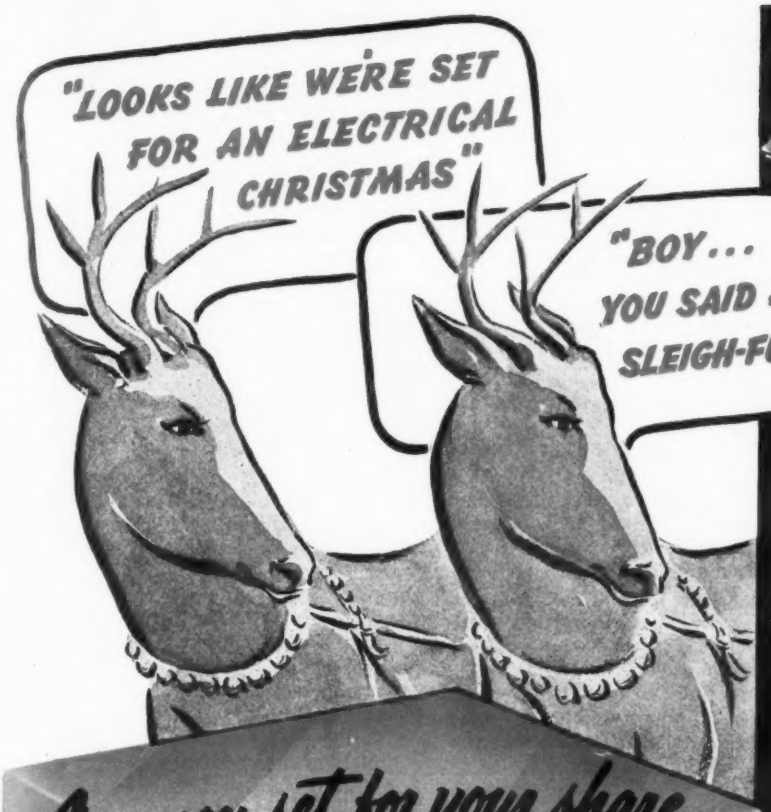
Operating Methods Discussed

A little more than half, 52 per cent, of all dealers answering the survey indicated that they carried some part or all of their credit paper. All department stores reported that they handled a part or all of their credit paper, while the exclusive dealers and contractor-dealers included the smallest number handling some part of their credit paper. Only about 42 per cent of this latter group handled all or a part of their credit paper.

Exclusive appliance dealers and contractor-dealers top the list, however, in the percentage of dealers operating a service department. Ninety-nine per cent of this group reported that they operate their own service departments. Although 90 per cent of all dealers reported the operation of such departments, hardware dealers were lowest with only 60 per cent having service departments and department stores next lowest with 70 per cent having service departments. Exclusive dealers and contractor-dealers average about two service men per store whereas all other groups average only one.

Dealers were asked to report what per cent of their washing machine and refrigerator sales involved trade-ins. The answers included such a wide range of replies that apparently the trade-in problem is one of individual policy rather than a specific characteristic of any groups in the trade. In their replies, dealers reported that 17 per cent of all washer deals involved a trade-in while 30 per cent of all refrigerator deals included a trade-in. However, it is to be noted that exclusive appliance dealers and contractor-dealers reported the highest per cent of trade-ins with 22 per cent for washers and 35 per cent for refrigerators, while hardware dealers reported the smallest number of trade-ins with only one per cent of washer deals involving trades and 10 per cent of refrigerator deals involving trades.

In answer to the question as to how they disposed of their trade-ins, whether reconditioned, sold "as is," or junked, most exclusive dealers and contractor-dealers reported that an effort was made to recondition all trade-in merchandise that



Are you set for your share ... of Holiday Sales?

This year, more than ever, the trend will be toward electrical gifts for the holiday season. For the new appliances are no longer just "practical" . . . they're handsomely styled for heart-warming giving. They get just as many excited "ahs" as anything else under the Christmas Tree.

The line of modern appliances distributed by GRAYBAR is jam-packed with eye appeal for buyers as well as recipients. Used for window-display, they'll attract new customers to your store. What's more, they're all items in which you can put your trust to *perform* as well as they look; each has the dual backing of a reputable manufacturer and the "satisfaction-insurance" of the GRAYBAR Tag.

For greater sales . . . for greater profits . . . better check with your GRAYBAR Representative today!

Executive offices:
Graybar Building, New York

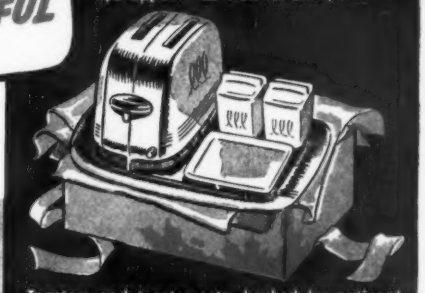
GRAYBAR QUALITY SINCE 1869

Distributed and guaranteed by

GRAYBAR ELECTRIC COMPANY

OFFICES IN MORE THAN 80 PRINCIPAL CITIES

Electric Clocks, Electric Irons styled for "eye appeal" as well as utility.



Toasters and toaster sets, backed by national advertising, will be more popular than ever this year.

Gleaming new electric roasters will ride high on the increasing trend to electric cooking.

The popular Cory glass coffee brewer with 2-heat electric stove will make more friends — more profits.

The Sunbeam Mixmaster, "fastest selling food mixer made", is sure to be a Christmas leader.

was worthy of such treatment. Other classes of appliance dealers were more inclined to sell trade-in merchandise "as is."

An increasing interest in such sales promotions as National Washer-Ironer Week is to be noted on the part of all appliance dealers, and especially in the case of exclusive appliance dealers. Twenty-eight per cent of all dealers replying to the survey reported that they participated in some way in the National Washer-Ironer Week promotion of 1939 and nearly 40 per cent expected to participate in the promotion to some extent in 1940. Contractor-dealers as a class reported the smallest interest in such sales promotion campaigns. Twenty-six per cent of all dealers replying reported that they have used some of the Modern Kitchen Bureau's promotion material in the past year. Again, the exclusive appliance dealers top the list in this group with more than 34 per cent reporting the use of such material last year.

"Courtesy" Sales Hurt Dealers

A large percentage of appliance dealers still find "courtesy" sales below retail prices to industrial employees or other customers a troublesome problem in their communities. Approximately 61 per cent considered the volume of business lost on this account as an important item. In answer to the question "Are advertised resale prices generally maintained in your locality?" appliance dealers were about evenly divided. A checkup on the location of dealers reporting that resale prices were not maintained indicated that practically none of these dealers lived in communities served by active electrical associations or leagues.

Only 25 per cent of the dealers replying to the questionnaire considered competition from the local electric utility a serious matter. The other 75 per cent did not believe that utility merchandising programs presented serious competition in their locality. Only 68 per cent of the dealers felt that the sales promotion cooperation extended by the electric utility company was of any value to them and only about half of this number considered it an important factor in their business.

Dealers were asked to comment on the appliance business in general for publication and a number of such comments are to be found on following pages.

Because of the importance of electric utility company merchandising practice on the activities of independent electrical appliance dealers, a study of utility company sales promotion activities was included in this survey.

Utility Activities Studied

Statements were obtained from 46 major companies serving 63 per cent of all of the domestic customers in the South. In analyzing the replies of these companies, percentages were calculated not on a basis of the number of companies but on the number of residential customers affected by any specific policy. This method of evaluating the extent to which certain policies are followed provides what might be considered a weighted average since it takes into account the size of the company.

Only nine companies, serving 12 per cent of the customers, reported that they were offering no form of cooperation to local appliance dealers. All other companies were found to be operating sales promotion departments offering some form of cooperation which varied, of course, from a limited amount of promotional advertising and the distribution of prospect lists to very intensive sales helps on a large scale.

The number of companies financing dealer credit sales decreased somewhat since last year. Only nine companies, serving 14 per cent of the customers, reported the financing of part or all of dealer credit sales. Some of these limited this service to small amounts and others offered it only during special campaigns. However, 20 companies representing 39 per cent of the customers served were found to have a policy of selecting dealer installment accounts along with electric service bills. This group included practically all of the companies who financed dealer credit sales themselves, and in addition those cooperating with the EHFA.

Free Appliance Installation

Five companies, serving 12 per cent of the customers, now provide free range or water heater installation on dealer sales of these appliances. Some of these do not supply the plumbing connections, however. In addition to these five companies that provide complete free installations, 13 companies, serving 25 per cent of the customers, reported that they provide a portion of the installation expense on ranges or water heaters. Several of these companies handle installations by simply allowing a cash subsidy while a few provide the connections but make only a flat charge that covers from one-third to one-half of the installation expense. One large company reported that it provided free installation only during special campaigns. The remaining 27 companies, serving 61 per cent of the customers, do not share any part of the cost of range or water heater installation.

A decreasing trend is observed in the number of companies providing appliance service for cus-

(*Continued on page* 44)

Built-in shelves and stands can be used advantageously in the display of small appliances. Here is a good example of small radio display in Barney Miller's Radio Shop, Lexington, Ky.

VARNISHED CAMBRIC CABLE · RUBBER POWER CABLES · BUILDING WIRE

CRESCENT

CRESFLEX

CRESFLEX NON-METALIC SHEATHED CABLE · SERVICE ENTRANCE CABLE · MAGNET WIRE · BARE WIRE

ARMORED CABLE · FLEXIBLE CORDS · LEAD-ENCASED AND PARKWAY CABLES · SIGNAL CABLE

Non - Metallic Sheathed Cable

Here's an *improved* CRESFLEX using Type R conductors with flame retarding and moisture resisting finish printed to show the size, type of insulation and voltage.

A further advance in construction has been developed by CRESCENT in a new method of applying the protective sheath to provide a more flexible cable that makes for easier fishing and faster, low cost installation.

CRESCENT
INSULATED WIRE & CABLE CO. INC
TRENTON, NEW JERSEY

SOUTHERN REPRESENTATIVES

ATLANTA, GA.
Edgar E. Dawes
A-4 Rhodes Bldg. Annex

NEW ORLEANS, LA.
Paul Hogan, Jr.
823 Perdido St.

CRESCENT SUPPLIES

the following choices of insulation for standard building wires and cables:

Code Grade, Type R
20% Performance Grade, Type RP
ENDURITE Heat Resistant, Type RH
IMPERVEX Moisture Resisting Grade, Type RW
SYNTHOL Synthetic Insulated, Type SN

and here is a partial list of CRESCENT products:

Genuine A. B. C. Armored Bushed Cable
Flexible Steel Conduit
Bare Copper Wire and Cable
Flexible Cords
IMPERIAL Portable Cords and Cables
Parkway Cables
Rubber Power Cables
Service Cables
Signal and Control Cables
Trench Cables
Varnished Cambric Cables
Weatherproof Wires and Cables

CRESCENT ENDURITE SUPER-AGING INSULATION · WEATHER-PROOF WIRE

Dealers Discuss Trade Problems

SPACE was provided on the questionnaire blanks of this survey for dealers to write in any comment they might care to make for publication on problems of current interest to the trade. Several of these discussions are reproduced here.

Specialization Found Profitable for Dealer

"Our business is somewhat unusual for the reason that we do not carry as many appliance lines as do some dealers. We have no objection to other lines of appliances, and may take on others, but the basis of our business is specialization in radios; we have specialized simply because most dealers don't.

"We have found placing great emphasis on the radio line particularly profitable because there is a slightly better margin in radios, since they are a luxury item. People buy them for entertainment rather than for service, and will pay more for them. They want to install the refrigerator and then forget about it as long as it operates, but they are conscious of the radio all the time.

"Further, there is more sales appeal in radios, since there seem to be more spectacular changes and advancements in radio; people like the new developments, such as the new portable battery sets. Usually there is less service involved in radio work than any other worthwhile appliance.

"Through the radio work we have also come into contact with numerous offices and persons wanting inter-building communication systems, and this has proved a profitable side-line, working in well with radios. Our feeling is that a dealer should make himself especially well known as a specialist in one specific line of appliances, and build his sales of others around that reputation."—*Kentucky.*

•

Utility Campaigns Termed Helpful

"Electric utility merchandising campaigns and activities are most important phases of the appliance dealer's picture. The program of advertising, both of appliances and of the economy and convenience of electricity, which is maintained by the utilities, is most helpful to the independent dealers, who could not put on so elaborate a campaign themselves, but who can tie in with the utility's major campaign with smaller ads.

"With regard to present merchandise as produced by the manufacturers, we believe the lines are well balanced for the present demand. However, we believe that manufacturers should soon begin looking to the day when the demand for small sizes in refrigerators and ranges will drop, as people are learning that greater convenience and economy is possible in the larger sizes, which offer the greater sales possibilities and profits to the dealers. Both dealer and manufacturer should be preparing for this change."—*Virginia.*

•

Ranges and Stokers Profitable Items

"The greater part of our profits come from ranges and automatic heating equipment such as stokers. Some of the dealers push the rest of the appliances so hard that there is little profit in any of them, and we carry them more to keep our line complete than for any other reason.

"We carry only one line in each appliance, as a rule, since we like to build up the manufacturer's name in the locality and trade on its prestige. This can't be done if we carry several lines or change lines frequently."—*Kentucky.*

•

Appliance Application Guide Suggested

"Our greatest merchandising problem is that of convincing the prospect that he or she should buy the size appliance that is adequate to the need or load, rather than being attracted by a smaller size in a lower price bracket. The large number of sizes and models in appliance lines tends to encourage this "step-down" on the part of the customer, though at the same time we believe a large number of models to be desirable in order to have one to fit every need and size family.

"When selling an appliance, we endeavor to find out the number in the family, and estimate the size needed for that particular family. Unless this is done, the purchaser is likely to be dissatisfied regardless of the brilliant performance of the appliance in every other way.

"In this regard, I believe that manufacturers might help us by getting up standardized tables on the model which is specifically made for a specific number of people, or meals, if it is a range or refrigerator, or the cubic feet of air, or btu if it is a fan, or heater, etc. This is done to some extent, but it is not put down on tabulated tables in black and white, to give us something conclusive to show the customer. We endeavor to do this ourselves to as great an extent as possible, but a tabulation by the manufacturers, based on national figures, would be of great help."—*North Carolina.*

•

Merchandising Standards Lacking in Rural Areas

"Manufacturers and distributors should be giving more thought to keeping up merchandising standards in rural sales. With rural electric lines spreading every day, and saturation of the city markets becoming higher, the market along rural electric lines is becoming very important, and I think that established, substantial city dealers should be given exclusive franchises covering these rural territories.

"When rural lines were first begun, Tom, Dick or Harry would write to the manufacturers and get to be their "agent" on such-and-such a rural line. Such agencies were readily granted, since they were well outside the city limits of the nearest dealership, and no demand for a dealership had ever been there before.

"However, such agents do not qualify as bona fide dealers: they have no stores, put in no stock of merchandise, operate no service department, do no advertising, and hire no salesmen. They sell out of a catalogue, and needless to say, they cut prices unmercifully, due to their complete lack of investment and overhead, cashing in on the acceptance for the product which has been painstakingly built up in town by the bona fide dealer who has an investment, and is supporting a staff of local citizens as sales-

Ever
West
TRAFF
to hel
Mor
PLA
GET Y
it's

Every house needs **Westinghouse**

BLONDIE

Copyright 1930-34-35 King Features Syndicate, Inc.

goes to LEISURELAND

A WESTINGHOUSE GAME

A TRAFFIC-BUILDING GAME to help you push *More free time for Mothers!*

FUN FOR EVERYONE and BUSINESS for you!

Blondie Cutout Display in full color stands 34 inches high—large enough to put in your window. Small enough to stand on the counter.

MORE FREE TIME FOR MOTHERS—This is the dramatic theme that sparkplugs the Westinghouse Fall Activity. It keys a tremendous program backed up by an intensive national advertising campaign.

IN ADDITION—Westinghouse has made available "Blondie Goes To Leisureland"—a timely, traffic-building game. It's a honey! A magnet to draw prospects to YOUR STORE.

IT'S IRRESISTIBLE—Hilarious entertainment built around America's most widely-printed comic strip. Everybody will want one. And you can offer one FREE to everyone who comes in to see your display of Westinghouse Leisure Line Appliances.

IT'S YOUR BABY!

Ask your Westinghouse man to show you *"It's Your Baby!"*... the Complete Plan Book that gives all the details of this *new Sales Activity*. Or write to Dept. 211.

WESTINGHOUSE ELECTRIC & MFG. COMPANY, MERCHANDISING DIVISION—MANSFIELD, OHIO

Tune In "Musical Americana," N. B. C. Red Network, Coast-to-Coast, every Thursday evening

Westinghouse

THE *Leisure Line* OF *ELECTRIC* HOME APPLIANCES

men. Not only should he be entitled to this new market, but the way it is now, chiselers will forsake the town merchants and go out in the country to one of these rural "agents," and get 30% or 40% off, thereby cutting into what town market the legitimate dealer has left, as well as depriving him of the rural market which should rightfully be his.

"The town dealers would cultivate the rural market, and do it right, if the manufacturers would cut off these price-cutting agents out of the rural lines."—*North Carolina.*

•

Competition from Gas Appliance Dealers

"The principal trouble in the electrical appliance business in this area is the hectic competition from the gas appliances, backed and augmented by the local gas utility, and sharpened by the lack of cooperation from certain finance companies operating in this state.

"Local appliance dealers, now handling their own paper, are having fine headaches trying to get a finance company to take over the paper at anything like the highly competitive terms offered by the gas company. Since most homes here are gas heated, the gas appliances have a logical entre, and gas ranges and heaters are now being offered for $1 down, the balance payable in from 36 to 48 months. Refrigerators are sold as low as $4.50 down, balance in four years, with carrying charges at 5%.

"The gas company is backing up this price-selling campaign with plenty of advertising on radio and in newspapers, and follow-up by specialty salesmen. They also offer to discount any and all gas appliance dealers' paper on the same terms as their own, so that, even though the electric rates here are among the lowest in the East, the electrical appliance business will continue to be hamstrung unless more favorable finance terms can be afforded them through some outside source."—*Alabama.*

•

Utility Programs Help More than Hurt

"We have heard and read a great deal about the trouble appliance dealers have with the electric utility as competition, since they merchandise appliances and have greater capital and promotional talent with which to work than the average dealer. We think that those who shout the loudest are hurt the least, for we have found the merchandising activities and assistance of the utility most helpful to us, both in actual sales and in creating acceptance and breaking down resistance against electrical appliances as being too costly to operate. If a dealership is progressive and ready to take advantage of opportunities offered to it, it will find that the utility is far more helpful than hurtful in its merchandising activities."—*Florida.*

•

Dealer Complains of Too Many Dealerships

"We believe that with list prices dropping and national conditions unsettled, the manufacturers should cease to seek new dealerships and concentrate on helping their established dealers do a better selling job. Under the present arrangement, with no protected territories to speak of, the profit can be taken out of the legitimate dealer's sales by inroads of border-line price cutters who do not support the salesmen or have the overhead and investment that the established dealer has.

"This is partly due to the fact that the manufacturers will not close a territory, even to their best dealers, and will continue to appoint new dealers, even when they can rent no more than a hole-in-the wall for a store and put in one unit for a stock. No ethical arrangement or support of ethical operation is possible with such competition, and in the long run, the field is being saturated faster at less profit to the operators in it than it should be.

"This condition could be quickly relieved if the manufacturers would lessen the number of dealers, rather than increasing it, and spend some of their wholesalers' time in working with the established dealers instead of out trying to create competition for them."—*South Carolina.*

•

Utility Cooperation Again Commended

"Whether retailers realize it or not, the cooperation of the electric utility is a very worthwhile and important factor in their merchandising, and in few cases if any does the merchandising operation of the utility present any detrimental competition to dealers. Dealers should stop to consider that by selling electrical appliances, the utility is merely taking sales which in all probability the existing dealerships would not get anyway, and that much more important than isolated sales is the building up of acceptance for electrical merchandise, which job the utilities do splendidly.

"No dealer can point to a utility which deliberately set out to beat him out of a sale; he is more likely to be handed a list of prospects by the utility, and have a good man sent out by them to help him work them, and then a demonstrator sent out to show the customer how to operate the new appliance, a job the dealer couldn't do himself. Having the utility on our side on the merchandising front means a great deal, since their power in advertising and merchandising is so much greater than any individual dealer's could be, and dealers should appreciate and cooperate with the power companies, rather than kicking at them as being competition."—*Alabama.*

•

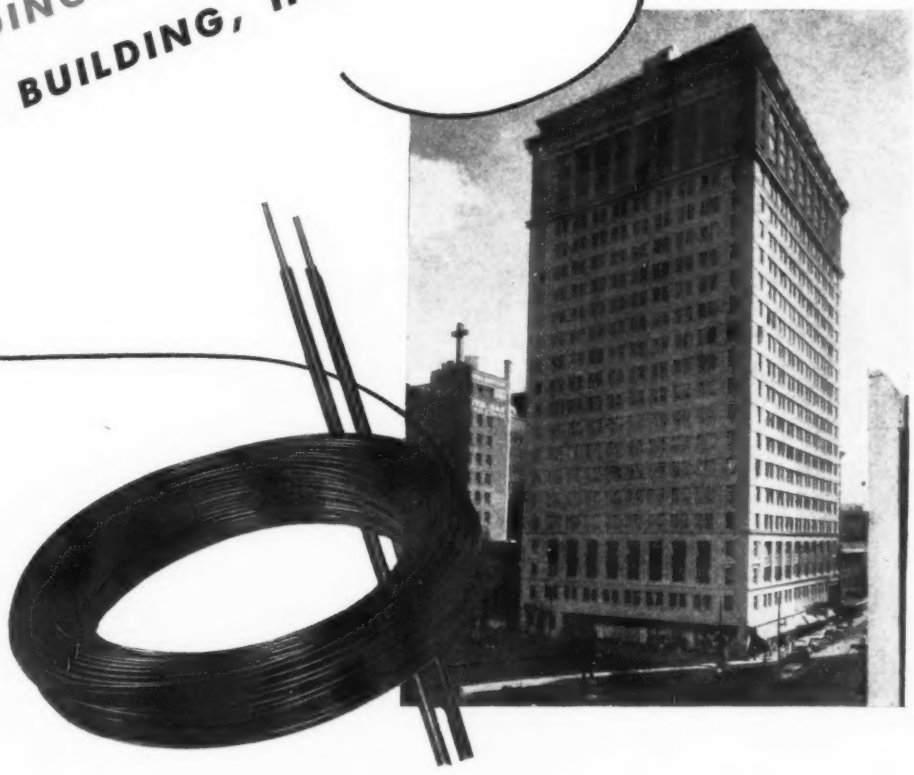
Exclusive Appliance Dealerships Disappearing

"We believe that there is a definite trend away from exclusive appliance merchandising operation, in favor of combined operations involving other lines of merchandise. This condition has always existed in department or furniture stores, of course, but we believe that exclusive appliance firms are, and will be, taking on outside lines of merchandise to balance the shortening of profit and increasing competition in appliances.

"The increasing reductions made necessary in national list prices of appliances have drastically reduced the dealer's profit per unit as well as his overall gross volume, and have practically forced him to buy other merchandise to keep his salesmen busy and keep his capital turning over. Other factors which contribute to this condition are the increasing demand for long trade-ins by a public spoiled through crazy trading in depression times, and a lessening of the down payments required for time contracts, making more defaulted contracts and also involving a greater tie-up of the dealer's capital.

"That this tendeny is moving rapidly is evidenced by the fact that there are only two or three substantial independent appliance dealerships left in Fort Worth; all the rest have become combined operations. This means that in the future, the appliance manufacturer is going to have to vie with other manufacturers for the dealer's attention and support of his merchandise, and also that the dealer is going to have to start breaking in his exclusive appliance salesmen for other activities than straight appliance sales."—*Texas.*

100,000 FEET OF FLAMENOL* BUILDING WIRE USED TO REWIRE SHELL BUILDING, HOUSTON, TEXAS



"ENTHUSIASTIC OVER SAVINGS"—SAYS BUILDING OWNER "EASY TO INSTALL"—SAYS ELECTRICAL CONTRACTOR

The 14 upper floors of the Shell Building, Houston, Texas, have been rewired with Flamenol Small Diameter Building Wire to provide for increased illumination. The Shell Building is comparatively new. When it was opened 14 years ago its wiring was completely adequate according to the standards of that day. But today's lighting requires heavier wiring.

Consequently, the owners of the building, the New England Mutual Life Insurance Co., of Boston, Mass. wanted the wiring improved. They called upon the Jacobe Bros. Electric Co. to devise a satisfactory and economical way to bring the wiring abreast of the times. Jacobe Bros., incidentally, wired the building originally.

To solve the present problem, approximately 100,000 feet of No. 12 Flamenol Building Wire were used to replace the existing wires in existing branch circuit raceways. New risers were installed using five tons of G-E White Conduit and G-E Code Grade Building Wire. G-E Performance Grade Wire was used for main elevator feeders.

New Life for Old Buildings

Small Diameter Flamenol Building Wires enable wattages in existing buildings to be increased inexpensively. The present wires in existing conduits can be replaced with more wires or with wires of larger capacity. Flamenol Building Wire is available in sizes 14 to 4/0 inclusive. It is insulated with a plasticized polyvinyl chloride compound. This insulation is tough, flame retarding and is high in dielectric and mechanical strength.

For further information on Flamenol Building Wire and for samples, see the nearest G-E Merchandise Distributor or write to Section W-0210, Appliance and Merchandise Department, General Electric Company, Bridgeport, Conn.

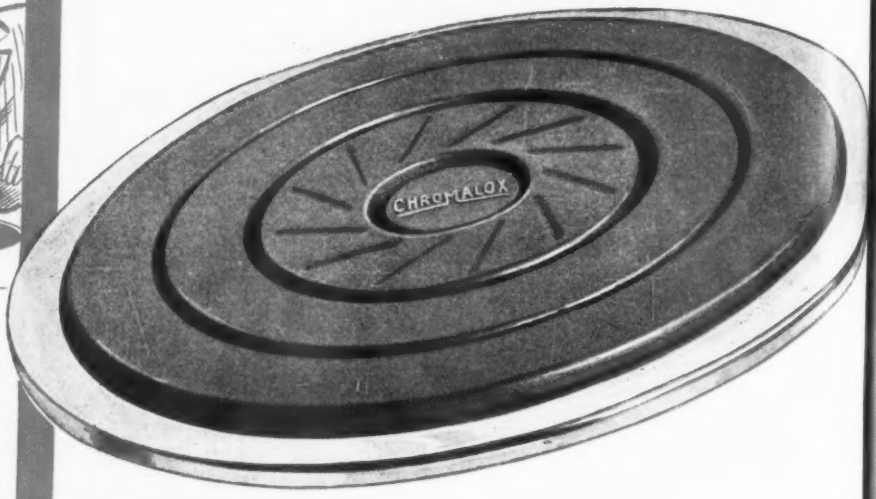
*Reg. U.S. Pat. Off.

GENERAL ELECTRIC

YOU SAY YOUR ELECTRIC RANGE WON'T WORK MRS. JONES? I'LL BE UP IN A JIFFY.
YOUR OLD RANGE UNIT HAS BURNED OUT, BUT I CAN REPLACE THAT RIGHT AWAY.
WHAT! YOU DON'T HAVE TO SEND AWAY FOR A UNIT?
THIS REPLACEMENT IS A GENUINE CHROMALOX UNIT, MRS JONES. IT'S EASY TO CLEAN AND SAVES MONEY TOO!
SEE HOW FAST THE CHROMALOX UNIT HEATS UP!
YOU'RE RIGHT THIS IS THE UNIT I'VE DREAMED OF!
WELL, THAT'S ONE MORE TIME I HAVE CHROMALOX UNITS TO THANK FOR A QUICK JOB, A SATISFIED CUSTOMER AND A PROFITABLE SALE!

Story of a quick, profita range unit replacement

WITH CHROMALOX RANGE UNITS



QUICK, BECAUSE you can fit *any* electric range from a small stock of Chromalox *stainless steel,* chrome-plated adaptor rings and a few Chromalox Unit assemblies. Just snap on the proper size adaptor ring and connect the terminals — presto, the job is completed.

PROFITABLE, BECAUSE you're doing the whole replacement job in a single service call. Your replacement stock is small and inventory reduced to a minimum. You're building business because you are installing a Chromalox unit with many big, exclusive features like *an all flat top for easy cleaning. "Two-Units-in-One"* — a factor which permits the use of the right sized cooking area for every size untensil, *heat by contact* — the fastest and most economical method. Keep customers happy and make money yourself with genuine Chromalox replacement units — they make satisfied customers and insure future electric range sales.

READ "How To Sell More Ranges"—a book full of facts and hints for *you*. Write for your free copy.

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RALEIGH, N. C.
W. R. Phillips

APPLIANCE Service

Short Cuts and Time Savers In Appliance Servicing

By Allen Parker

Checking Controls On a Sealed Unit

When called upon to start a sealed refrigerator unit that has stopped, the service engineer should first check the electrical current supply, and if it is satisfactory, then determine whether the motor itself or the control is the source of trouble. If this plan is followed, a good bit of time may be spent trying to make the control start the unit.

I have found that a starting cord that will greatly simplify this problem can be very easily made up in the shop with about six feet of rubber covered wire, an attachment plug, a push button switch, and three test clips. The cord is simply a method of connecting the 110 volt circuit directly to the running winding of the motor. An auxiliary lead from the "hot" wire to the starting winding with the push button switch in series with it will momentarily energize the starting winding until the motor has reached full speed.

I would suggest that the control leads always be disconected from the motor before the test clips of the test cord is attached, and on some makes of refrigerators, time might be saved in getting to the motor terminals by removing the contents of the box and placing it on its back on a delivery blanket or other padding on the floor. If the unit fails to start, it may be that the compressor is stuck, and that once it has been broken loose, it may again run for a good while without giving trouble. They can often be broken loose by connecting the test cord to 220 volts for a few seconds, and some units that again stick have been corrected by injecting through the charging connection a few ounces of pyrol or xylene which is highly penetrating and will reach the sticking parts.

Should the control prove to be the source of trouble, it is best whenever possible to replace the complete control. And whether the control or parts of the control are replaced, it is very important that exact duplicates be used. Substitute control parts that look alike but are taken from larger or smaller refrigerators may cause disastrous results, especially in the case of thermal heating coils and relays. The result of using such wrong parts is likely to be a burned out control, or motor, or both.

Finding Cause of Bad Compressor Shaft Seals

Replacing shaft seals in compressors is a common everyday occurrence in most service men's work. But, before you replace a seal do you always try to determine the reason that it failed? In most cases, there is a reason and if it is not corrected it will repeat itself.

Lack of oil in the crankcase of the compressor possibly accounts for the greatest percentage of seal failures. A compressor may have an ample supply of oil in it and operate for several years without any trouble and then without any apparent oil leak the seal starts leaking. A check of the crankcase at this time might reveal the oil supply as being low, and with the oil supply low, the seat of the seal heated and carbonized what little oil might be left on it thus starting the seal to leaking. The oil, of course, is still in the system, and the compressor was robbed by the pistons pumping the oil into the high side of the system.

Some oil pumping is normal in all compressors and this is taken

(*Continued on page* 44)

A neat service shop has a two-fold advantage: it not only enables the service man to work with a minimum of lost time and confusion but it impresses the customer with the thought that his job is in the hands of a competent, well-equipped organization. This radio service shop, operated by John Kessler, of Hartsville, S. C., is an unusual example of a well planned and well kept shop. Mr. Kessler is shown in the insert. (Photos courtesy Hygrade Sylvania Corp.)

MOTOR Service

Connecting Diagrams for Lap Wound A-c Motors

By A. C. Roe

Railway Motor Engineer
Westinghouse Electric & Mfg. Co.

A NEW series of connecting diagrams for lap-wound motors, that will include the ten and twelve pole motors, is started with this article. However, due to the small number of two phase motors in this pole range, the diagrams will be limited to the three-phase star and delta type of connections. Therefore, the extended series will include 28 additional diagrams, divided into five 3-phase star 10-pole; five 3-phase delta 10-pole; nine 3-phase star 12-pole; and nine 3-phase delta 12-pole. Because of the more complicated appearance of the 10- and 12-pole diagrams, they will be presented in a slightly larger form.

Table I is a guide to the new series of 10- and 12-pole three-phase diagrams, listing all the 28 connections. This is similar to the table published in the July, 1939 issue for 4, 6 and 8 pole diagrams. It will be noted that the new series of diagram numbers are continued on up to number 72 which is the total for both series.

For dual voltage connections, Table 2 is given to show how the motor leads are connected to give the desired connection. For example, in figure 45, the high voltage connection under star connection would provide a series star arrangement, while the low voltage connection would provide a 2-parallel star arrangement. Likewise for the delta connection, Fig. 46, the high voltage lead arrangement in Table 2 would result in a series

TABLE 1

Schedule of Diagrams for Lap-Wound 3-Phase Induction Motors

No. of Poles	Connections (Star)	No. of Leads	Fig. No.	Connections (Delta)	No. of Leads	Fig. No.
	Series or Parallel	3 or 9	45	Series or Parallel	3 or 9	46
	*Parallel	3	47	*Parallel	3	48
10	5 or 10 Parallel	9	49	5 or 10 Parallel	9	50
	*5 Parallel	3	51	*5 Parallel	3	52
	10 Parallel	3	53	10 Parallel	3	54
	Series or Parallel	3 or 9	55	Series or Parallel	3 or 9	56
	*Parallel	3	57	*Parallel	3	58
	2 or 4 Parallel	9	59	2 or 4 Parallel	9	60
	*3 Parallel	3	61	*3 Parallel	3	62
12	3 or 6 Parallel	9	63	3 or 6 Parallel	9	64
	*4 Parallel	3	65	*4 Parallel	3	66
	6 or 12 Parallel	9	67	6 or 12 Parallel	9	68
	*6 Parallel	3	69	*6 Parallel	3	70
	12 Parallel	3	71	12 Parallel	3	72

*These diagrams are arranged for magnetic balance and equalizer connections.

delta connection; and the low voltage lead connection would provide a 2-parallel delta diagram connection.

Table 2 must be used for figures number 45, 46 49, 50, 55, 56, 59, 60, 63, 64, 67, and 68, and reference to Figures 2 and 3 in the July, 1939 issue can be made for a clear understanding of the correct use of Table 2. Where space permits, however, this table will be repeated in the issues including the diagrams mentioned above.

Figure 45 shows the 30-pole phase groups arranged to permit bringing out 3 or 9 leads; or it can be used as a standard series star 3-lead diagram; or as a dual voltage nine lead diagram as indicated by the dotted line group connections. With nine leads, there will be a permanent star connection, but for 2-parallel star, a second and separate star connection is made by joining leads L_4, L_5, L_6 together.

Figure 46 shows the 30-pole phase groups arranged to provide either a single voltage three lead diagram, or a nine lead dual voltage connecting diagram with delta dual voltage connections. Care must be taken to connect the proper motor leads to the line leads as A and L_7 and L_6 to the A-phase line lead, etc.

In this second series some data will be presented regarding the problems of arranging lap wound induction motor windings to suit changed conditions—such as voltage changes, change in speed, frequency, and horsepower.

Table 2

Dual Voltage Connection For 3-Phase Star

For High Voltage: Connect A, B, and C to lines; connect L_4 to L_7; connect L_5 to L_8; and connect L_6 to L_9.

For Low Voltage: Connect A and L_7 to A-phase line; connect C and L_8 to C-phase line; connect B and L_9 to B-phase line; and connect L_4, L_5, and L_6 together.

Dual Voltage Connection For 3-Phase Delta

For High Voltages: Connect A, B, and C to lines; connect L_4 to L_7; connect L_5 to L_8; and connect L_6 to L_9.

For Low Voltages: Connect A, L_7, and L_6 to A-phase line; connect C, L_8, and L_4 to C-phase line; and connect B, L_9, and L_5 to B-phase line.

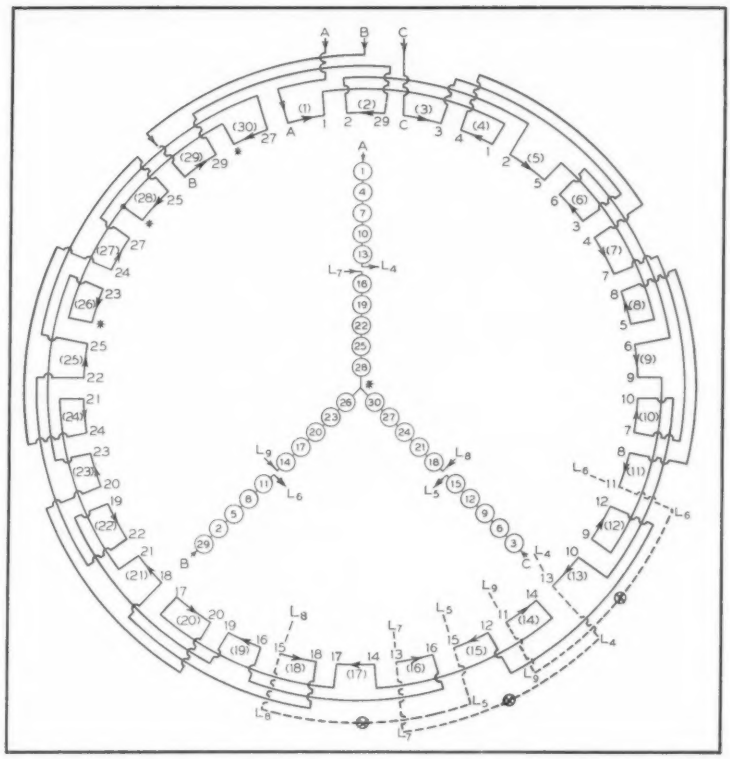

Fig. 45. Series or parallel star connection for 10-pole, three-phase, lap-wound induction motor with 3 or 9 leads. Cross in circle indicates point at which winding is opened to obtain nine leads.

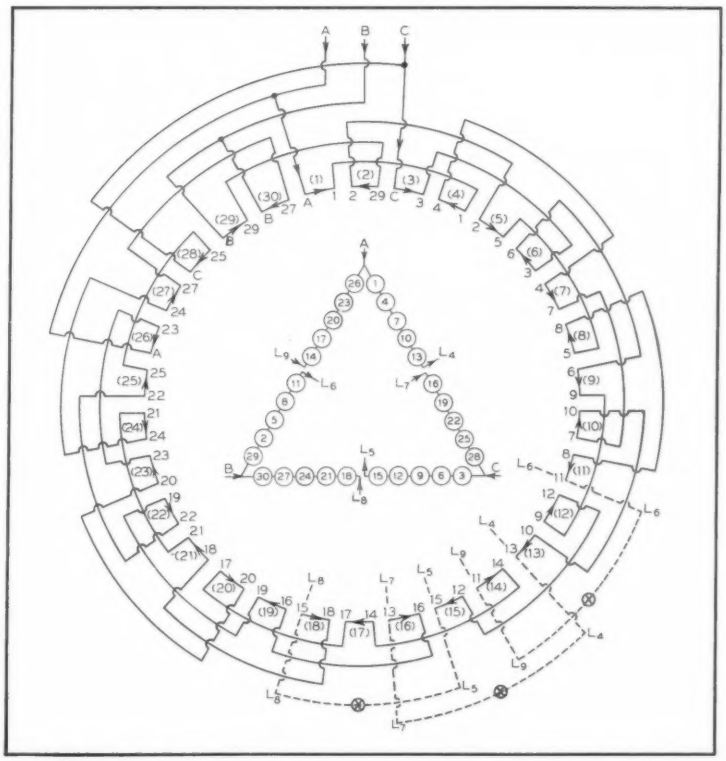

Fig. 46. Series or parallel delta connection for 10-pole, three-phase lap-wound induction motor with 3 or 9 leads. Cross in circle indicates point at which winding is opened to obtain nine leads.

SERVICE...

NATIONAL
ELECTRIC PRODUCTS
NE
6 SYSTEMS
National "DiLec" Wire
SAFECOTE N MARKED-MEASURED
N.E.C. STD. 600 VOLTS
RECORD YOUR TAKE OUT
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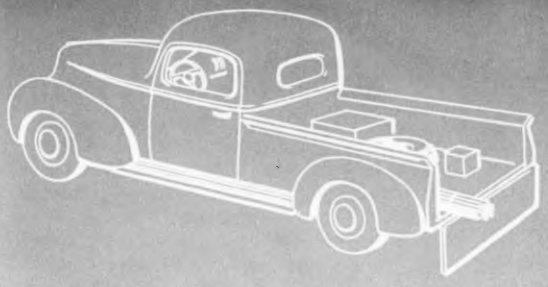

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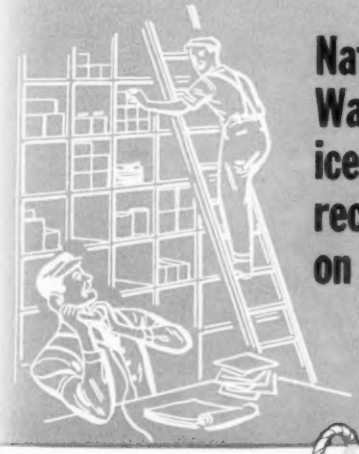
National Electric materials melt into the job without those interferences and time lapses which add up into lost profits.



National's new Atlanta warehouse at 188 Walton Street is also ready to give you service. Orders are shipped the day they are received. Call Main 1695 for Quick Service on Serviceable Materials.

Greetings to the Jacksonville Convention

National Electric
PRODUCTS CORPORATION
Pittsburgh, Pa.

Finding Cause of Bad Compressor Seals

(*Continued from page* 39)

into consideration by the manufacturers who design the systems so that the oil will travel the refrigeration cycle and return to the crankcase through the suction line. However, a bad trap in the low side of the system might seriously affect the return of the oil. Such a trap is often caused by the refrigerant supply running low on the low side of a flooded system. Naturally a case of this trouble can be easily corrected by correctly charging the system with refrigerant and allowing the unit to cycle a few times.

Jobs will be encountered that pump too great amount of oil by the pistons to travel the refrigeration cycle, with a consequently large portion remaining in the condenser. This not only reduces the condensing capacity but allows the compressor to run with an insufficient amount of oil, causing seal and other trouble. A case of this kind can be properly corrected only by dumping the contents of the liquid receiver and then installing an oil separator in the discharge line of the compressor so that the oil might be returned to the compressor crankcase as it is pumped out.

Another cause of seal trouble is worn crankshaft bearings which allow the crankshaft to vibrate and disturb the seal seat. This can easily be detected before replacing the seal by checking the amount of loose motion of the shaft. This is done by hand, lifting the fly wheel end of the shaft up and down and crossways. If any loose motion is found the bearing should be replaced, otherwise a repetition of the seal trouble is sure to occur soon.

Southern Contractors Active in Association

(*Continued from page* 19)

In the last few years, the Walker Electric Company has built up a large manufacturing business in the field of lighting panels, service switches, outlet and junction boxes, and steel and aluminum cabinets of all kinds. The rapid growth of this business brought about the separation of the manufacturing business from the electrical contracting business and in June, 1939, it was announced that the Walker Electric Company was incorporated as a separate manufacturing business and that the electrical contracting business was transferred to a new company known as the White Electrical Construction Company. Mr. Walker remained as president of the Walker Electrical Company and K. D. White, formerly vice-president of Walker Electric Company, was named president of the White Electrical Construction Company.

Dealer Problems Studied in Survey

(*Continued from page* 32)

tomers of appliance dealers. Thirteen companies, serving 23 per cent of the customers, reported that appliance service was available to dealers. The basis for charging for this service varied to a considerable extent. In some cases it was supplied at cost while in other cases labor is supplied free and dealers are billed only for cost of parts used. In the case of most companies, however, a flat hourly charge is made for labor and parts are supplied at cost.

Every one of the 46 companies reported that they actively promoted appliance sales in some form. This promotion ranges from advertising alone to intensive merchandising departments. However, 13 companies, serving 27 per cent of the customers, replied that they did not merchandise appliances at all and a few additional companies replied that they were restricting their operations to the sale of small appliances or certain load-building appliances for which public acceptance had not yet been created. The number of customers served by companies that do not merchandise appliances has increased somewhat over last year's survey in which only 20.7 per cent of residential customers were served by companies having this policy. The increase is due to some extent by the municipal companies in Tennessee but one or two large private companies have adopted this policy since last year.

Little change is to be noted during the past year in the policy of companies providing bonus payments for dealers or dealer salesmen on any or all sales of load-building appliances. A total of 14 companies, serving 28 per cent of the customers, are providing such payments in one form or another. Of these companies, however, eight companies, serving 19 per cent of the cutomers, offer such bonus payments or prize money on the sale of major appliances only during special campaigns.

Of those companies giving a regular bonus on all sales, most of them paid $4 for each range sale and from $6 to $8 on each water heater sale. However, one company gives the dealer $20 for each range he sells from his own stock, providing that it is connected to that company's lines.

Commercial Cooking Council Activities

(*Continued from page* 21)

use of all electric cooking equipment, it is interesting to note that those companies reporting on the division of 1939 sales, estimate that 60.5% of last year's sales were of electric counter and pantry type equipment and 39.5% were of heavy duty equipment. Fifty-six companies reported sales of counter and pantry type equipment only; two companies reported sales of heavy duty equipment only; and sixty-four companies reported sales of both types of equipment.

Fifty-seven companies report they do nothing to offset the cost of wiring, fifty-one allow from $2.50 to $6.00 per kilowatt connected up to certain limits, and one company has an allowance based on the E.A.R. of the equipment. Six companies furnish wiring plans, three companies report that the cost of wiring is included in the selling price, one company sometimes finances the wiring and one company allows $15 for residential range in commercial use.

Of the reporting companies this year 47.5% did nothing to offset wiring cost of electrical operation. While only 43% of last year's reporting companies paid a wiring allowance, 45% of this year's companies are now paying an allowance. The trend appears to be toward giving wiring allowances in producing this class of business, and when consideration is given to the load-building value of commercial electric cooking equipment, this is undoubtedly an excellent means of obtaining a larger share of this profitable business.

In reply to the question "Do you finance equipment sales?" fifty-four companies reported "yes," thirteen companies finance their own sales, nine companies reported "some," fifty-one reported "no" and two companies did not reply.

A message to
Electrical Contractors attending the convention of the
National Electrical Contractors Association in Jacksonville,
October 21-23, 1940

★Welcome to Jacksonville

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Coolair
TRADE MARK

Home-Cooling and Commercial Exhaust Fans

See this
Quality Attic Fan
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PROFIT-EATING
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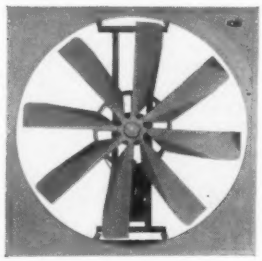
You've got the jump on competition when you sell the Coolair line because no other attic fan can offer all of these features—Quality Points that keep customers satisfied and protect your profits against costly trouble calls.



1. Patented built-in springs that eliminate vibration noise.
2. Streamlined inlet for quieter performance.
3. Oversize ball bearings in fan hub for lifetime service.
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5. Light compact steel construction throughout—no cheap materials to warp, twist or tear loose.
6. Certified air ratings, according to ASHVE Test Code.
7. A fan size for every home or commercial job—8 inches to 9 feet in diameter, up to 150,000 cfm.
8. Five-year guarantee on residence fans, backed by the pioneer manufacturer in the home-cooling field.

VISIT OUR BOOTH

Visit our booth at convention headquarters in Jacksonville and let our representatives show you just exactly why the Coolair fan means more satisfied customers and greater net profits for you.

After you've seen our exhibit at convention headquarters . . . .

Visit the Coolair Plant

Come out to our plant in the Murray Hill section of Jacksonville and see the newly enlarged factory buildings in which we manufacture Coolair fans. Our representative at the Coolair booth will gladly arrange transportation for you.

Coolair TRADE MARK
Ventilating and COOLING Systems

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Manufacturers . . . . . JACKSONVILLE, FLORIDA

Jacksonville Chapter Outstanding in Association Activities

WHAT is it that makes some organizations strong and successful, resourceful and adequate, and able to achieve universal cooperation of both their own members and outside influences in accomplishing their objectives?

Probably that question cannot be answered in words, but when delegates to the 1940 convention of the National Electrical Contractors Association assemble at the George Washington Hotel in Jacksonville, Florida, on October 21, they will have the chance to meet the members of the host chapter of the Association which stands out as being one of the most active and successful in the country.

Probably one of the most difficult tasks facing a chapter of the N.E.C.A. is the sponsoring of the national convention. The program which the Jacksonville chapter has outlined has apparently been handled with the same competence which has characterized all of its activities for, according to officials of the Association, it is one of the most complete ever arranged.

Interest centers on the host chapter for many reasons. It probably includes a larger percentage of the electrical industry in its region as members than any other chapter, numbering among its members about 97% of the electrical contractors of the Jacksonville trade area, centering around a city of 175,000. All members live rigidly up to the code of standards set by the chapter. When an association does not have to solicit membership, but rather grants it as recognition of outstanding qualities of the applying firm, it can definitely be said to be successful.

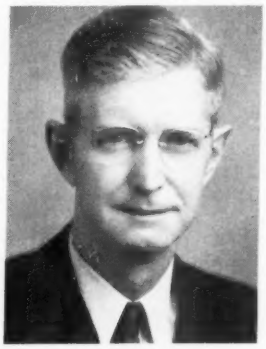
This is the case of the Jacksonville chapter of N.E.C.A., where members must have been actively in business for six months and proven their stability and ability to live up to the association standards before being admitted to the Association. They must have established a reputation for honesty and fair dealing, and be known to be likely to live up to it, for after membership in the Association is granted, the chapter pledges itself to make good on all contracts of a member firm, should such a firm go out of business.

The Jacksonville chapter has an impressive record behind it, and outstanding in that record is the period during which W. O. Henderson, of the Henderson Electric Company, has been president, and the work Mr. Henderson has done in bringing the association's standards to their present high level.

Organized in 1905, the chapter is a charter member of N.E.C.A. and its predecessor organizations. In Jacksonville, the association operates the Adequate Wiring Certification Plan, of the National Adequate Wiring Bureau, supervising the plan in its entirety.

When Mr. Henderson took hold eight years ago, many systems of bidding and contracting had been tried out: bid depository, credit plans, and all the rest, without achieving uniformly satisfactory

(*Continued on page* 80)



W. O. Henderson
President

Rudolph Baacke
Vice President

These are the present officers of the Jacksonville Chapter, N.E.C.A. (Not shown in the photographs is Dixie Carroll, who is also a director.)

Walter T. Poole
Secretary

S. C. Reddick
Treasurer

C. R. Lovell
Director

H. H. Sonnenberg
Director

JACKSONVILLE CHAPTER NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION

EXTENDS A CORDIAL

WELCOME

To The Electrical Contracting Industry On Their Visit To Jacksonville And The Thirty-Eighth Annual Convention Of The National Electrical Contractors Association, October 21, 22, 23, 1940. Convention Headquarters, George Washington Hotel, Jacksonville, Fla.

The electrical contractors of Jacksonville are pleased with the prospect of entertaining the members of the industry in Jacksonville—the "Gateway to Florida." The ideal weather that may be expected in October, the splendid recreational facilities available, the many places of historic interest which may be visited, and the comprehensive program including many nationally known electrical authorities, all indicate that this will be one of the most enjoyable and profitable conventions of the Association.

The Jacksonville Chapter of the National Electrical Contractors Association extends its welcome not only to the members of the National Association, but to every progressive contractor who is interested in the development of the electrical industry. No industry is changing more rapidly and the individual who desires to familiarize himself with its technical, legislative and economic progress will find no better opportunity than that afforded by attendance at the annual national convention.

"Co-Operation Is Essential To The Success Of Our Business"

To the Contractors

In attendance at the Annual Convention of the National Electrical Contractors Association at Jacksonville, the General Electric Supply Corporation extends best wishes for a pleasant and profitable visit to Florida.

We shall be glad to welcome you

at any of our offices — located at Jacksonville, Miami, Tampa, Savannah and Atlanta.

This Invitation Is Also Extended

on behalf of the other 107 houses of the General Electric Supply Corporation located in the principal cities of the United States for the purpose of giving prompt and efficient service nationally.

GENERAL ELECTRIC SUPPLY CORPORATION

GEORGIA
ATLANTA and SAVANNAH

FLORIDA
JACKSONVILLE—MIAMI—TAMPA

A Cordial Invitation

TO ATTEND THE THIRTY-EIGHTH ANNUAL CONVENTION OF THE

NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION

AT

Jacksonville, Florida

OCTOBER 21, 22 AND 23, 1940

You Will Be Welcome—you do not have to be a member of the National Electrical Contractors Association to attend this important electrical industry meeting.

Electrical South joins the Jacksonville Chapter of the N.E.C.A. in extending you a cordial invitation to attend the Annual Convention of the N.E.C.A., to be held at Jacksonville, October 21, 22 and 23, 1940.

This meeting presents an outstanding representation of America's leading electrical contractors—the men who are taking the responsibility of raising and maintaining the high standards of practice in electrical wiring and construction work in all its phases.

Subjects of vital importance to you will be discussed at the meeting. Jacksonville also offers boundless recreational and sight-seeing treats. And Jacksonville's climate is ideal.

Electrical South

(The South's Own and Only Electrical Business Journal)

ATLANTA, GEORGIA

ENGINEERING SECTION

Distribution System Economics

Part 2—Secondary System Design

By P. E. Benner

Central Station Department
General Electric Co.

CORRECT secondary design pays large dividends in improved service and lowered investment. The time spent in determining the most economical layouts for average operating conditions will be repaid many times over. Practices which have been found to result in greater economy and better service include the use of relatively small secondary conductors (Nos. 2, 3 or 4, the interspacing of transformers for controlling voltage drop, the moderate loading of transformers, and the banking of secondaries for reducing instantaneous voltage fluctuations and excessive drops due to unbalanced secondary loads.

Length of Secondary Circuits

The problem of secondary design is simply one of determining the size and spacing of distribution transformers and the size of the secondary circuit. As shown by Fig. 1, the most economical design will show savings in investment up to 30% or 40% over distribution transformer and secondary layouts which off-hand might not appear to be unusual.

One of the most important phases of the problem is providing for load growth. In arriving at the most economical design, it is insufficient and misleading to figure on providing a system for existing load, in as much as such a system might require extensive and costly changes in the event of a normal

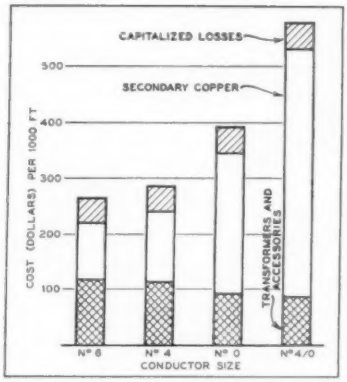


Fig. 1. The most economical secondary design will show savings in investment up to 30% or 40% over transformer and secondary layouts which might not appear, offhand, to be unusual. These different layouts are based on a load density of 10 kw per 1000 ft.

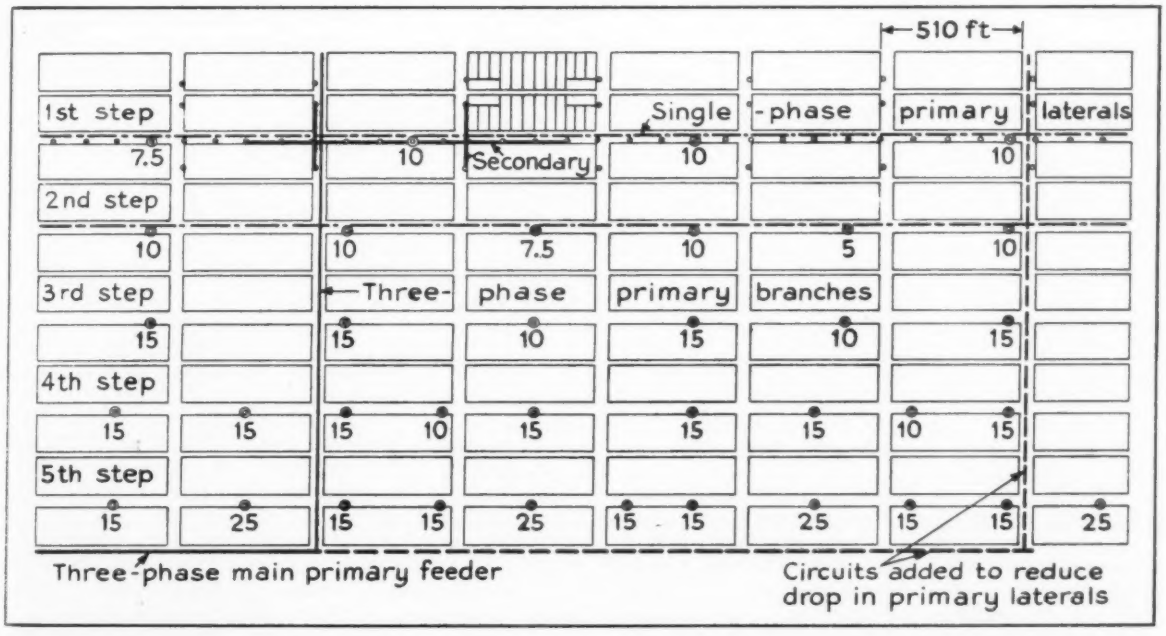


Fig. 2. An example of the progressive or straight-line design of secondary system which is particularly practical, economical and flexible. Secondaries are constructed in a continuous line down each street with no cross ties between streets. The lines are sectionalized at points between transformers. Increased load is provided for by interspacing transformers and breaking secondaries up into shorter sections. In the diagram above, a small circle indicates a pole and a double circle indicates a pole with transformer, the capacity in kva being shown by the numeral. The initial layout is shown at top and successive changes because of increased load are shown below.

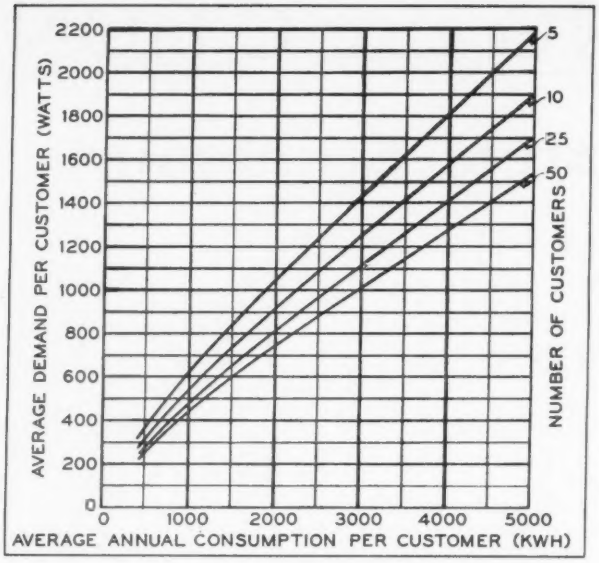


Fig. 3. These curves provide a means of determining load density when the average annual kilowatt-hour consumption and number of customers is known.

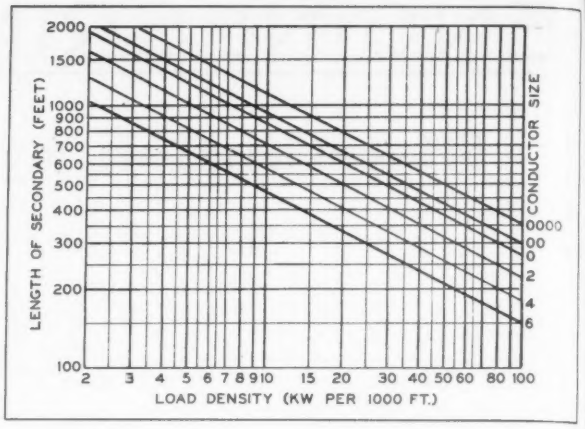


Fig. 4. This curve facilitates economical transformer loading. The ratio of the final over the initial transformer load is applied to the estimated load density to determine the load density which will exist when the load approximates the distribution transformer capacity.

increase in load to 1½ or 2 times its present value.

Keeping the voltage drop within reasonable limits is the governing consideration in secondary design. Voltage drop is a function of the impedance of the circuit, and the magnitude of the load itself. In a secondary circuit there are two possible methods of decreasing the voltage drop. One is to increase the size of the conductor in as much as the voltage drop will decrease almost proportionally as the cross section of the conductor is increased.

The other method is to decrease the length of the circuit which has the double effect of actually decreasing the load, and also decreasing the impedance, so that actually the voltage drop is decreased, not in direct proportion to the length of the circuit, but in proportion to the square of the length of the circuit. In other words, if the circuit is cut in half, the drop is actually reduced to one-fourth of its original value.

To illustrate the economic advantage of controlling the voltage drop of secondary circuit by changing the length rather than the conductor size, assume a typical case of a distributed load served by No. 4 secondary circuit with the distribution transformers spaced 1200 ft. apart. When the load increases to approximately 10 kilowatts per 1000 feet, the drop will amount to approximately 3% in the secondary, which is about the maximum permissible for good customer voltage under average conditions. In order to provide for increased load growth, it would be possible to change the No. 4 conductor to No. 1/0, and thereby reduce the drop to 1½%.

Neglecting the cost and loss of investment due to changing the conductor size, and taking into account only the difference on a per lb. basis between a No. 1/0 and a No. 4 secondary, it is found that the difference in investment between No. 1/0 and No. 4 conductor at 15 cents per lb. for triple braid, weather-proof copper conductor amounts to $128. This is more than the cost of a 10 kva distribution transformer which, if installed midway between existing transformers, would not only reduce the secondary drop to ¾%, but would provide additional capacity for approximately double the present load.

In order to make the same reduction in voltage drop by means of increased conductor size that is obtained by interspacing transformers, 250 MCM conductors would be required which would represent an investment of $432 in excess of that for the No. 4 conductor, without taking into account any additional cost of installing this larger size circuit.

The plan which is based on this fundamental idea of controlling secondary voltage drop, and which has come to be quite generally accepted as providing a practical, economical, and flexible secondary system, is known as the progressive or straight-line design. In this scheme the secondaries are constructed in a continuous line down each street with no cross ties between streets, as shown by Fig. 2. Sectionalizing points are provided between the secondaries of adjacent distribution transformers.

It has been found as a result of a number of studies of this type of secondary system* for average residential areas having a load density of the order of 5 to 25 kilowatts per 1000 feet, that it is most economical to use secondary wire sizes not larger than No. 2. It has also been shown that No. 4 secondary copper will economically take care of load densities up to 40 or 50 kilowatts per 1000 feet. Increased load is provided for by interspacing transformers and breaking secondaries up into shorter sections as shown by the successive steps in Fig. 2.

It will be noted that this plan of secondary distribution involves the installation and relocation of distribution transformers as the load increases. It is obviously desirable therefore that the distribution transformer installations be made in such a way as not to require special pole structures. In other words, from the standpoint of flexibility and overall economy, it is important that the transformer installation be as simple as possible and adaptable to any pole, rather

*"A Review of Secondary Distribution," by W. P. Holben, Electrical Engineering, vol. 66, page 114, January, 1937.

You can have

THE RIGHT LINK *at the* RIGHT PLACE *at the* RIGHT TIME

KEARNEY'S *Precision Built* FUSE LINKS

THERE are many reasons why so many operating men are using Kearney Fuse Links. Whether they specify the new Type 200, the Quik-Action Fitall or the Trip-O-Link Fuse, they find they get the dependability expected of a precision built link. With such factors as adaptability, strength, temperature, durability, accuracy and speed carefully considered in their design, these links assure efficient switch performance. And now ease of handling, storing and dispensing have been added to other features to give even greater value, at no extra cost.

features of the NO. 12165-B FUSE LINK DISPENSER

See from the ground whether you have links on the pole ready to handle an emergency. Pul Tabs of Kearney Fuse-Paks tell you.

Keep your fuse link coordination schedules accurate with a supply of proper amperage sizes right on the pole.

You might have the right link on your storeroom shelf, but why not have it at the point of use—in a pole-mounting fuse container?

Using **KEARNEY FUSE LINK DISPENSERS** *COMBINED WITH NEW* **PUL-TAB FUSE-PAK**

At the right, the new Kearney Pul-Tab Fuse-Pak. Contains 5 fuse links, each packed in individual weather-resistant bags, each bag having a "pul-tab" clearly marked with amperage rating of link.

Above, the new Kearney Fuse Link carton for easier storeroom handling contains 5 Pul-Tab Fuse-Paks, 5 links to a Pak, 25 links to a carton. Each carton carries information on primary fuse sizes for distribution transformers.

NOW—minimize the risk of upsetting your fuse link coordination schedules—the hazards of over-fusing—unnecessary delays in restoring service. Assure these advantages by installing, right on the poles, at important switching locations, a Kearney Fuse Link Dispenser which is specially designed to hold a Pul-Tab Fuse-Pak containing five proper links.

After all, for convenience and emergencies, you want the right link at the right time, at the point of use—and reserve links, of course, on your storeroom shelves.

all Kearney Links packed in Pul-Tab Fuse-Paks

Whether or not you use the No. 12165-B Fuse Link Pole Dispensing Boxes which, incidentally, cost only 49c each, take advantage of the handy Pul-Tab Fuse-Paks and handy cartons of 25 links, the standard package for all Kearney Links, at no extra cost.

JAMES R. KEARNEY CORPORATION
4236-42 CLAYTON AVENUE - ST. LOUIS, MO.
Canadian Plant - Toronto, Canada

Table I—Economic Comparison of Distribution Transformer Loading

Year	1	2	3	4	5	6	7	8	9	10
Load in Kva*	**5.35**	**5.75**	**6.15**	**6.60**	**7.05**	**7.55**	**8.10**	**8.70**	**9.30**	**10.00**
10 Kva Transformer										
Carrying Charge @ 12%	$12.42	$12.42	$12.42	$12.42	$12.42	$12.42	$12.42	$12.42	$12.42	$12.42
Core loss @ .64c per kwh	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
Copper loss @ 4c per kwh	1.85	2.12	2.44	2.85	3.20	3.69	4.28	4.94	5.67	6.54
Revenue loss @ 1c per kwh	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	$17.47	$17.47	$18.06	$18.47	$18.82	$19.31	$19.90	$20.56	$21.29	$22.16
Present Value @ 5%	$17.47	$16.90	$16.40	$15.95	$15.50	$15.12	$14.60	$14.60	$14.42	$14.30
Present value of 10 yr. cost										$155.51
7½ Kva Transformer										
Carrying Charge @ 12%	$10.53	$10.53	$10.53	$10.53	$10.53	$10.53	$10.53	$10.53	$10.53	$10.53
Core loss @ .64c per kwh	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69	2.69
Copper loss @ 4c per kwh	2.61	3.01	3.44	3.97	4.52	5.22	5.95	6.90	7.87	9.12
Revenue loss @ 1c per kwh	.37	.41	.47	.53	.61	.70	.79	.90	1.04	1.20
Total	$16.20	$16.64	$17.13	$17.72	$18.35	$19.14	$19.96	$21.02	$22.13	$23.54
Present Value @ 5%	$16.20	$15.85	$15.55	$15.30	$15.10	$15.00	$14.90	$14.95	$15.00	$15.18
Present value of 10 yr. cost										$153.03
5 Kva Transformer										
Carrying Charge @ 12%	$ 8.16	$ 8.16	$ 8.16	$ 8.16	$ 8.16	$ 8.16	$ 8.16	$ 8.16	$ 8.16	$ 8.16
Core loss @ .64c per kwh	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02	2.02
Copper loss @ 4c per kwh	4.21	4.87	5.60	6.44	7.31	8.40	9.67	11.20	12.75	14.78
Revenue loss @ 1c per kwh	1.07	1.23	1.40	1.59	1.83	2.10	2.40	2.78	3.17	3.66
Total	$15.46	$16.28	$17.18	$18.21	$19.32	$20.68	$22.25	$24.16	$26.10	$28.62
Present Value @ 5%	$15.46	$15.51	$15.58	$15.74	$15.90	$16.20	$16.60	$17.18	$17.70	$18.48
Present value of 10 yr. cost										$164.35

*Load growth assumed at 7½ per cent, per year.

than to require an extra length pole or an extra cross arm.

Design of a Secondary System

The starting point in making an actual secondary layout is the determination of the load density per 1000 feet. A number of different methods are used in estimating the load density. One very usable method depends upon a derived relation between the kilowatt-hour consumption and the demand. The curves of Fig. 3 show this relationship for various annual kilowatt-hour consumptions and groups of 5 to 50 customers. The diversified demand per customer, as obtained from these curves, multiplied by the number of customers per 1000 feet provides the necessary estimate of the load density.

Having the load density, the transformer spacing may be determined, based on the wire size selected. As previously mentioned, numerous studies have shown the advantage of using secondary conductors of the sizes Nos. 2, 3 or 4; however, this can be determined by an economic study if the findings of these other operators are not acceptable.

The next step involves the practice of transformer loadings. The ratio of the final over the initial transformer load is applied to the estimated load density to determine the load density which will exist when the load approximates the distribution transformer capacity. Assuming a 3% drop, the curve, Fig. 4, can be used to determine the secondary length from the transformer which would be 50% of the actual transformer spacing. The distribution transformer size would then be equal to the transformer spacing in thousands of feet, multiplied by the load density per 1000 feet, multiplied by 100, and divided by the per cent initial load on the transformer.

For example, if the spacing came out to be 800 ft.; the present load density was calculated at 10 kw per 1000 ft.; the initial loading of the transformer is 50%; and the final loading 100%; then the required distribution transformer size would be 16 kva and a 15 kva transformer would be installed.

If a distribution transformer is loaded up to capacity, and it is desired to determine whether to replace it with a larger transformer or to interspace additional transformers, the same procedure is followed, except in this case the load density could be figured from the transformer load, rather than estimated by some other method.

Unbalanced Secondary Loads

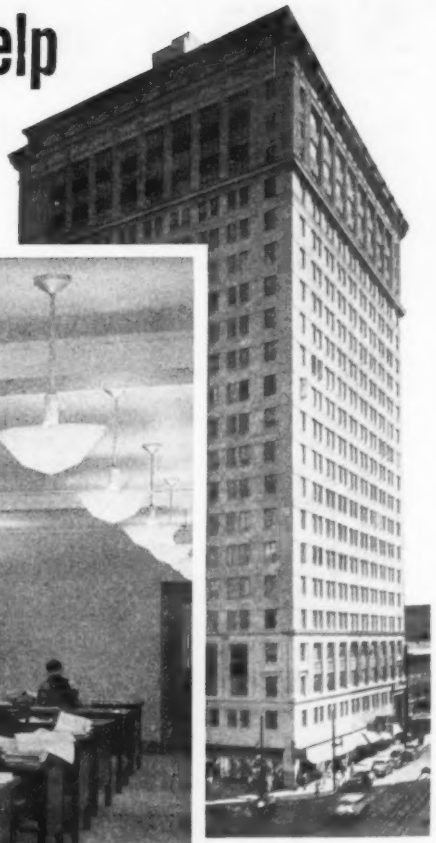
The curves of Fig. 4 are based on an assumed unbalance of 15% in the secondary loads, the per cent unbalance being defined as the percentage which the neutral current is of the sum of currents in the two other conductors. The amount of unbalance in the secondaries has a very marked effect on the voltage drop, and is frequently the cause of low customer voltage.

For the 15% unbalance assumed, the secondary drop on the side of the secondary carrying the most load is 45% greater than if the secondary load were balanced, based on full neutral drop. Similarly, for a 25% unbalance, the drop would be 75% greater than for balanced secondary load. If the neutral is grounded at various points throughout its entire length, the extra drop due to unbalance may be somewhat less (75% to 80%) than the value given above because of the effect of the ground

(*Continued on page* 78)

Wakefield COMMODORES help

modernize lighting for Shell Corporation in Shell Building, Houston, Texas



This is typical of the modern seeing conditions provided in Shell Corporation offices by Wakefield COMMODORES.

Takes only a jiffy to see the effect of this unit in any office. Ask about the Commodore demonstrator.

. . . and everybody benefits!

THE "SHELL" FOLKS...BY BETTER LIGHT—BETTER SIGHT
THE CONTRACTOR...BY THE INSTALLATION OF 1000 COMMODORES
THE UTILITY...BY 12 KW MORE LIGHTING LOAD ON EVERY FLOOR

Here's why the lighting in many an office is being modernized with COMMODORES. They make better light for better sight a reality..providing 86% of the light from the bare bulb, by test of Electrical Testing Laboratories..and it is smooth, glareless light that speeds work and is kind to eyes. They're smart and modern in appearance, too. And maintenance costs are low because the COMMODORE'S feather-weight shade, molded from Plaskon, is easy to clean; and easier and safer to handle. Get the facts about the COMMODORE for better office lighting..when you plan modernization or new construction. Ask for the booklet "Recommendations for Office Lighting".

THE F. W. WAKEFIELD BRASS COMPANY
1000 SOUTH PARK, VERMILION, OHIO

NEWS of the INDUSTRY

Prospects Good for Fall Water Heater Sales

As utilities and dealers see it, the prospect of setting a new high on electric water heater sales, this fall and early winter, is a one-two-three proposition:

(1) The season is right. With cool weather comes the prospect of cold cash. Home owners and housewives are turning interested ears to the story of the convenience, economy and luxury of electric water heating.

(2) The boom in the construction of new homes has opened up a fertile field for sales and installations.

(3) That temperamental gentleman, Donald Duck, as spokesman for The Modern Kitchen Bureau, is staging the most spec-quack-ular campaign of his illustrious career.

Through that strange quirk of American imagination, a terse suggestion by such a widely publicized character as Donald Duck is often more forceful than a lengthy oration from a rostrum. The Modern Kitchen Bureau has shrewdly made the most of this. "Take it easy," is their advice through Disney's Duck, "with the comforts of electric water heating."

Already utilities and dealers have been provided with five thousand kits containing material for the campaign. The power of national advertising is switched on. Radio spot announcements are ready—and right. There are newspaper mats, direct mail folders, a colorful window banner and a set of catchy display cards, all bearing Donald Duck's good advice about the joys of electric water heating. Dealers are most enthusiastic. M.K.B., they agree, is helping them to hit the jackpot again.

Rural Electrification Subject Of Virginia Meeting

"The Economic Use of Electricity for Improving Farm Income" was the theme of a two-day conference on rural electrification held at Virginia Polytechnic Institute, Blacksburg, Va., September 9 and 10 under the auspices of the department of agricultural engineering of that institution.

Dr. Julian A. Buruss, president of V.P.I., extended a welcome to the assemblage at the opening session. In attendance were rural cooperative officials, utility executives and other persons working in a supervisory capacity.

The opening address on "The Economic Situation and Agricultural Outlook," was made by Dr. H. N. Young, head of the department of agricultural economics, V.P.I.

The keynote of the conference was expressed by H. P. Hess, manager of the rural electrification division, Westinghouse Electric and Manufacturing Co., East Pittsburgh, Penn., who, in giving a summary of the conference objectives, stressed the need for more cooperation and coordination of utilities with extension services of state colleges. Mr. Hess urged particularly that great possibilities lie in making special appeal to the youth of 4-H clubs and the women of home demonstration clubs. Another point made by Mr. Hess was that present day methods of selling more rural electrification points in the direction of farm machinery, whereas investigation has revealed that at least two-thirds of the service is used in the home.

In the discussion groups, it was pointed out that too often the rural engineer of a power company is called upon for actual detail work, while his time and services could be better employed in directing such work.

R. H. Driftmier, head of the agricultural engineering department of the University of Georgia, talked on the need for thoroughly trained men, and insisted that workers in rural electrification should have a farming background.

An interesting and helpful feature of the conference was the illustrated panel discussion on important farm electric uses, in which 16 topics were allowed 5 minutes each for discussion. These topics were: water systems, truck farm irrigation, farm garden irrigation, dairy utensil sterilization, soil sterilization, soil heating, electric brooding, hay drying, electric fences, portable farm motors, feed grinding and ensilage cutting, potato curing and storage, fruit storage, poultry lighting, milk cooling and farm yard lighting. Speakers chosen for this panel discussion were persons who had had several years experience in farm electrification with electric service organizations.

Following the conference, an intensive 3-day course on the newest developments in farm and home electric service and equipment was held. This was designed especially for field men, dealers and others interested. There was no registration fee. Factory experts made up the faculty and the excellent laboratory facilities of the V.P.I. were available. Accommodations were obtainable in the new dormitories at nominal cost, and meals were served in the faculty apartment dining-room.

"Spec-quack-ular!" says Disney's famous Donald Duck about Modern Kitchen Bureau's powerful, compact and complete fall campaign for water heater sales. Catchy advertisements in Better Homes and Gardens and a full, colorful array of material for dealers' use will help them hit the jackpot.

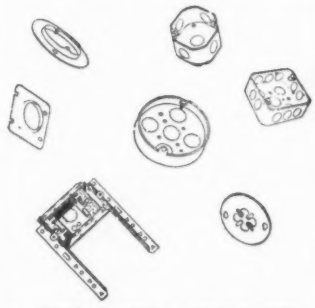
Prof. WECO Says:

The Electrical Contractor's Problems are OUR Problems

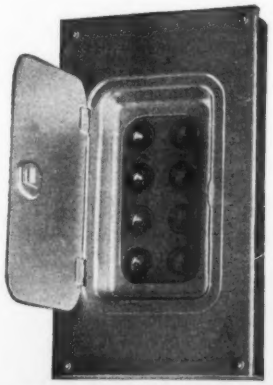
We are constantly bending our efforts toward producing more dependable, more sturdy, and more simple wiring devices for you.

SOLD ONLY THROUGH RECOGNIZED ELECTRICAL WHOLESALERS

Walker Products are sold through the best electrical jobbers. This testifies to their quality.



1—*OUTLET AND SWITCH BOXES*



2—*MODERN FUSE GROUP PANELS*

ILLUSTRATED:

1—Complete line of up-to-the minute Outlet and Switch Boxes.

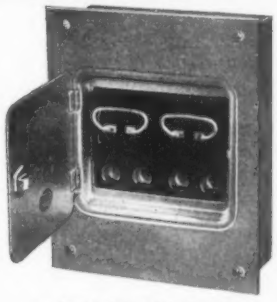
2—Modern Fusegroup Panels...front and trim in one piece...rugged construction...neat appearance...Boxes galvanized; trims baked-on aluminum finish...cold mold receptacles... small dimensions...plenty of knockouts... ample wiring space.

3—Complete line of Pullout Switch devices.

4—Rounded Corner Cutout and Junction Boxes. Streamlined for the job where appearance counts.

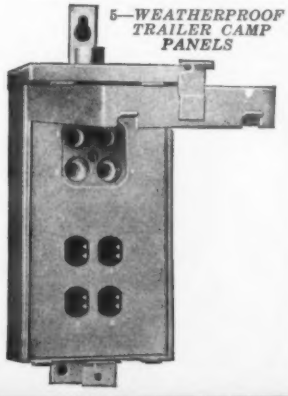
5—Weatherproof Trailer Camp Panels...tamperproof...for protection of camp owner against excessive use of current...baked-on aluminum finish...Can be arranged for locking while trailers are plugged in.

Send today for complete catalog.



3—*PULLOUT SWITCHES*

4—*ROUNDED CORNER CUTOUT AND JUNCTION BOXES*



5—*WEATHERPROOF TRAILER CAMP PANELS*

WALKER ELECTRICAL CO.
ATLANTA, GEORGIA

Retailers Give Pledge to Keep Prices in Line

Here is the pledge of the retailers of the nation to national defense as given at Washington, August 29, at a conference of retail representatives of all industries called by the National Defense Advisory Commission:

"The representatives of retail merchants here assembled announce that it is their intention to devote their efforts to prevent so far as possible any unjustifiable rise in retail prices, by urging upon the general retail trade vigorous opposition to all price increases which appear to be unwarranted and which might cause difficulty to the Govenment and the consuming public.

"We agree to cooperate wholeheartedly with the National Defense Advisory Commission in determining the justification of any price rise that might take place; in exchanging information; and in advising with the National Defense Advisory Commission as to the wisest plan to pursue.

"We announce that, providing the cost to us of the merchandise that we sell does not vary substantially, and providing also, that our cost of doing business does not increase substantially, we will not alter past methods and practices in arriving at our selling prices."

The meeting was attended by 123 representatives of retail trade associations and of retail stores. The conference elected an advisory committee of nine members for continuing cooperation between retailers and the Office of the Consumer Advisor, Harriet Elliott.

Ben Lewis, chief economist on Miss Elliott's staff, warned retailers to cooperate, "or else," in these words:

"We lay no claims to omniscience, and we can scarcely hope to cover the market for every commodity in every locality. And we shall make mistakes. But to the extent of our resources, and abilities, if the public is imposed upon by unfounded admonitions to 'buy now and buy more because goods are scarce and prices are going up' and is counseled thus to behave in exactly the way which will result in shortages, and spiraling prices, we shall call to account the persons responsible, through every instrument upon which we can lay our hands. And if price rises occur which cannot be justified by increases in cost or by results in terms of nationally desirable effects upon production, or if resort is had to undisclosed deterioration of quality to mask the exaction of unfair prices, we hope to be smart enough and tough enough to bring about a rapid, effective, and lasting correction."

Five-Year Lighting Program Sponsored by Texas Utilities

The Dallas Power and Light Company, in cooperation with the Texas Power and Light Company and the Texas Electric Service Company, is sponsoring a five-year "Light Conditioning Program," beginning with the fall season this year. The purpose of this campaign is to popularize the new, inexpensive methods of light conditioning which have been developed in the past year by the lighting equipment manufacturers.

The program opened with a jobbers' meeting, on August 30, in the Dallas Power and Light building. M. B. David, a light conditioning consultant from New York, lectured to 132 jobbers from Ft. Worth and Dallas on the mechanics and merits of light conditioning.

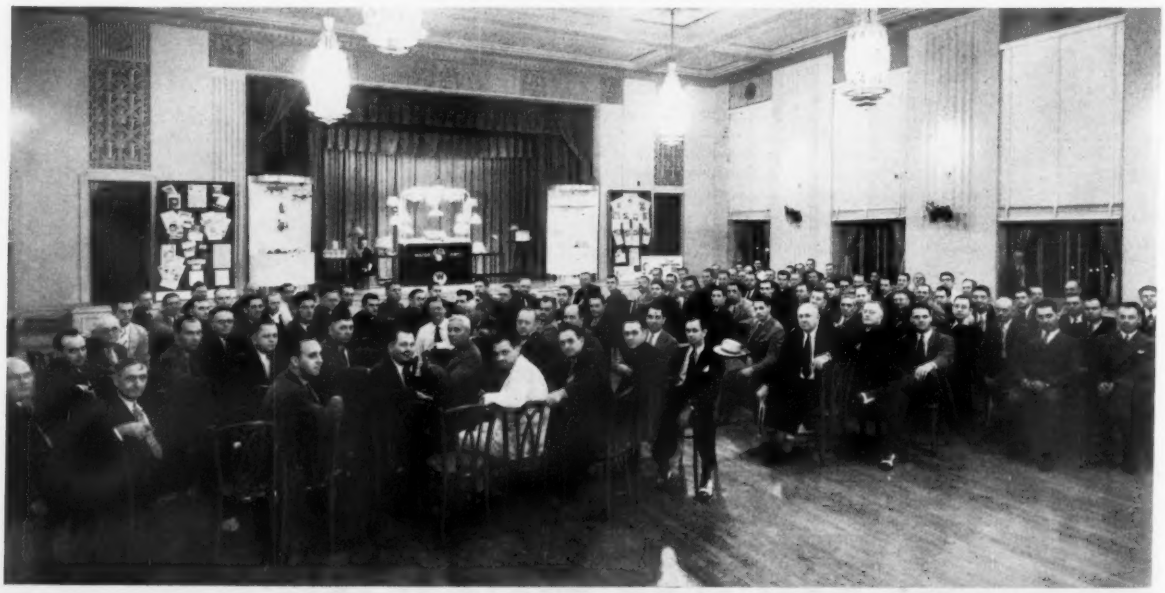
R. C. Dixon, resident sales manager, Dallas Power and Light, and O. G. Osburn, resident sales manager, Texas Power and Light, outlined the advertising campaign to be conducted by their respective companies. Both companies plan extensive exhibits of light conditioning, further training meetings for wholesalers, dealers, and salesmen; and advertising by newspaper, poster boards, hand-out literature, mail, display cards, and movie trailers to be shown at eleven Dallas theaters. General Electric and Westinghouse sponsor two radio programs—"The Hour of Charm" and "Musical Americana"—which will be of value to the campaign.

The program particularly stresses silvered bowl lamps and clip-on shades, as they are believed to be simple, most economical, and a very effective method of light conditioning.

Uniform Residence Wiring Sought in North Carolina

A special committee of the North Carolina Chapter of the International Association of Electrical Inspectors, at a meeting in Raleigh, N. C., August 14, perfected a draft of model specifications for wiring new dwellings.

Those attending the meeting were C. S. Whitaker, city electrical inspector at Durham, N. C., and president of the Southern Section of the International Association of Electrical Inspectors; Prof. L. M. Keever, of N. C. State College, Raleigh; N. E. Cannady, state elec-



First meeting on Five-Year Lighting Program sponsored by Texas utilities.

Already Prepared

Anticipating the greater production that is sure to come with industrial preparedness, it is assuring to know that General Cable is already prepared to meet the increasing demand for quality wires and cables.

GENERAL CABLE

BARE and INSULATED WIRES and CABLES for EVERY ELECTRICAL PURPOSE

General Cable Corporation Sales Offices: ATLANTA • BOSTON • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND • DALLAS • DETROIT
KANSAS CITY (MO.) • LOS ANGELES • NEW YORK • PHILADELPHIA • PITTSBURGH • ROME (N.Y.) • ST. LOUIS • SAN FRANCISCO • SEATTLE • WASHINGTON (D.C.)

trical engineer, of Raleigh; and W. T. Anderson, Charlotte, N. C., electrical inspector.

According to Mr. Whitaker, the purpose of the draft of model specifications is to obtain uniformity in the wiring of new dwellings throughout North Carolina. The draft, he said, is similar to the ordinance now regulating wiring of new residences in Durham and other cities, and it is hoped that other cities will adopt the draft, or portions of it, as ordinances.

The finished draft is to be prepared by Prof. Keever, and printed copies are to be distributed to all electrical contractors and inspectors in the state.

Wiring and League Conference in Chicago

The Fifth Annual Conference of the International Association of Electrical Leagues will be held at the Palmer House, Chicago, on November 13 and 14. These will be open sessions and any member of the industry interested in cooperative market development operations, as carried on by electrical leagues throughout the country, will be welcome.

G. W. Weston, secretary-manager of the Electric Association of Kansas City and president of the I.A.E.L., will be the general chairman.

On Tuesday, November 12, the day preceding the league conference, there will be a discussion of the promotion of residential adequate wiring. This special meeting is being jointly sponsored by the International Association of Electrical Leagues and the National Adequate Wiring Bureau and is open to all interested.

Among the subjects to be discussed at the wiring conference are a number of promotions which are typical of what is being done in the country as a whole. They will include programs being carried on in Minnesota, Chattanooga, Wisconsin, the Inland Empire, and the West Penn territory. The speakers will be the men who are doing the job and ample time will be left for discussion.

Two wiring subjects, dealing with residential and commercial rewiring, will be included in the league program and other subjects to be discussed are: fluorescent lighting; the league's place in improving trade and public relations; social activities; electrical shows; promotion of refrigerators; ranges, water heaters and roasters; sales opportunities in radio; sales training courses; industrial development, and other live topics.

Following the open league sessions, elections of officers and directors of the I.A.E.L. for the ensuing year will be held.

Wholesalers' Semi-Annual Convention in Pittsburgh

The semi-annual convention of the National Electrical Wholesalers Association will be held in Hotel William Penn, Pittsburgh, Penn., October 23 to 25, 1940.

Wiring Bureau Reports Activities in the Field

New Orleans, La.—A prize contest on certified adequate wiring installations for contractors is a feature of a comprehensive promotion plan for adequate wiring recently developed by the Electrical Association of New Orleans and published in a twelve-page bulletin. Both the New Orleans Public Service, Inc., and the Louisiana Power & Light Company are lending full support to the activity.

* * *

Knoxville, Tenn.—Informal educational talks comprise the first step in a three-point program developed by the Knoxville Electric Power & Water Board to promote the adequate wiring idea in connection with their rural electrification program. The program was laid out by general sales manager, C. O. Carpenter, Jr., and is producing excellent results. Before this activity was undertaken, 50 per cent of the homes wired in small rural line extensions had been rejected by the state inspector. Today, however, only 2 per cent have failed to pass inspection and it is estimated that from 75 to 80 per cent of the 1800 new rural customers have installed wiring sufficiently adequate to meet all present and estimated future needs.

* * *

Chattanooga, Tenn.—Four new homes, with certified adequate wiring, were recently opened for public inspection in Brainerd Hills, by the builder, W. F. Osborne. Members of the home service staff of the Electric Power Board were present to answer questions. Each of the homes was floodlighted and all of the wiring features were identified by marker cards. The builder reports that a number of excellent prospects were obtained.

* * *

Baltimore, Md.—In this city, people have a decided preference for the garage light controlled at the rear entrance of the house. This fact was determined through answers to a wiring questionnaire prepared by the lighting service department of the Consolidated Gas, Electric Light & Power Company and handed recently, with an attractive booklet, to each visitor to a demonstration model home sponsored by radio station WFBR. The other most popular items were lights controlled at all main doors; up and down stairs control of cellar light; rear entrance light; laundry appliance outlet and light over the kitchen sink.

* * *

Jacksonville, Fla. — The New Business Department of the City Electric System is sponsoring a fifteen-minute "Better Living" program every day over radio station WJAX for a two-week's period and featuring adequate wiring. In the commercial announcement on each program, the customer and his architect are offered a wiring layout service.

"New Business" Responsibility Assigned to Ted Ferguson

Announcement has just been made by John W. Carpenter, president of the Texas Power & Light Company, of the appointment of Ted B. Ferguson, vice president in charge of advertising, as vice-president in charge of advertising and new business.

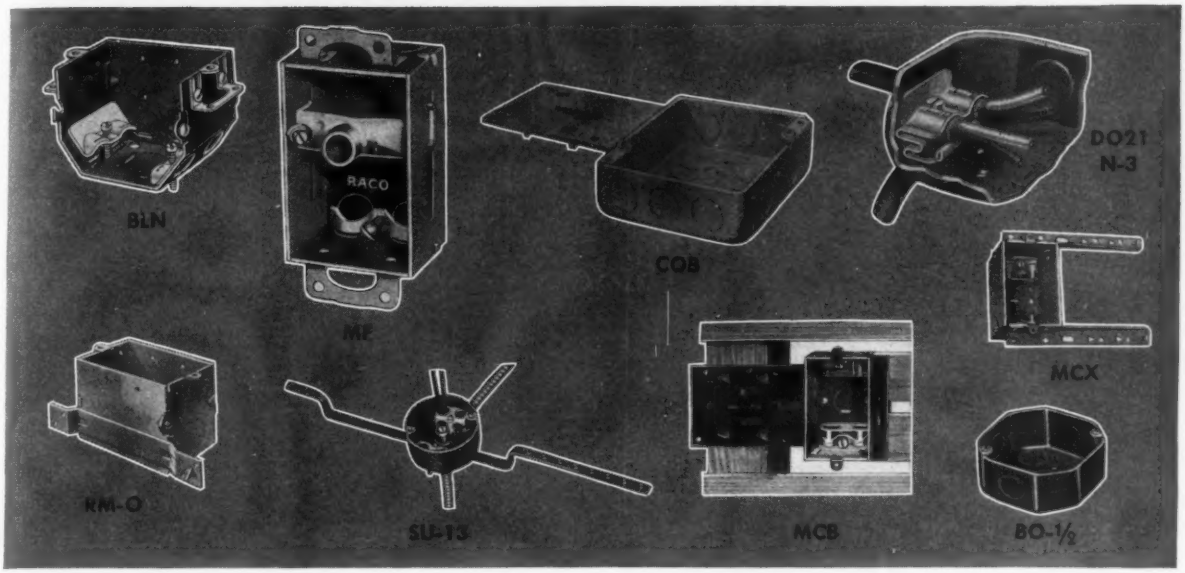
Mr. Ferguson has been with the Texas Power & Light Company for 14 years, during which time he has served as salesman, district manager, advertising manager, and vice president in charge of advertis-

Ted B. Ferguson

ing. Prior to his joining the Texas Power & Light organization, he had had wide experience in the insurance underwriting field, as special agent and in advertising and sales promotion work.

Mr. Ferguson was born and reared in Dallas. After spending several years in the insurance business in Dallas and Atlanta, Georgia, he came to the Texas Power &

A PLUS LINE!



THE SURE WAY TO MEET THE REQUIREMENTS OF THE 1940 CODE

NEW developments and new standards have changed industrial, commercial and residential wiring. The contractor can no longer depend on what once seemed adequate. Nowhere is this more evident than in the 1940 Electrical Code—it emphasizes the need for a PLUS LINE!

Raco • All-Steel has kept in step with wiring trends in every section of the country—with a complete line, tailored to fit the 1940 needs.

In **Outlet Boxes,** for instance, Raco • All-Steel makes all standard sizes—3¼" Octagon, 4" Octagon, 4" Square, 4⅛" Square—in all standard depths and all standard KO arrangements.

PLUS

Every required assembly of Clamps, Brackets, External Ears, Box and Bar assemblies.

When you standardize on Raco • All-Steel • Products, a complete line of **Switch Boxes**—all the standard Square Cornered and Beveled Cornered Boxes—is at your service.

PLUS

All the newer and more efficient styles of Clamps, Extended Ears, Mounting Brackets, Lath Supports, Side Mounts, and Fixture Bridges.

The same high quality and the same completeness characterize all Raco • All-Steel • Products. You can't go wrong when you use them. They provide many advantages for rural and urban modernization work. Architects, Contractors, Electricians and Builders have given Raco • All-Steel • Products their stamp of approval—and you may be sure that this PLUS LINE will command new preference in 1940 and 1941.

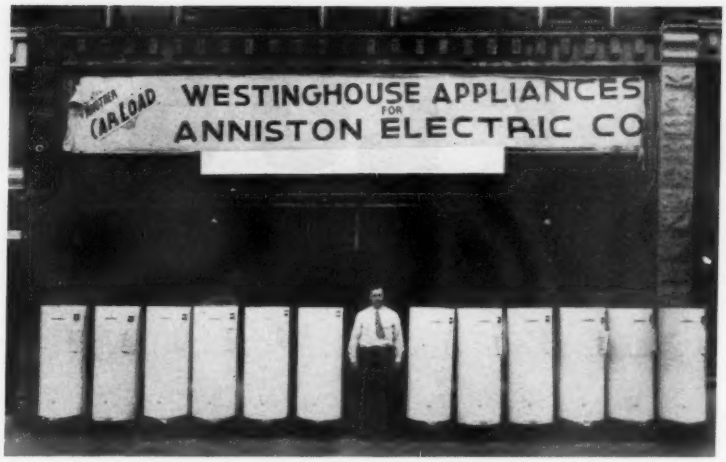
Write for your copy of the Raco • All-Steel • Products catalog . . . it's yours without any obligation

Distributed Nationally by **ALL-STEEL-EQUIP COMPANY,** INCORPORATED
210 Griffith Ave., Aurora, Ill. • *Factories:* South Bend, Ind., Aurora, Ill.

RACO • ALL-STEEL • PRODUCTS
Switch Boxes • Outlet Boxes • Cutout Boxes • Cabinets • Conduit Fittings
Distributors in All Important Centers

Light Company in 1926. In 1928, he was appointed district manager for the company at Corsicana. While in Corsicana, he served as president of the Rotary Club, president of the Corsicana Chamber of Commerce, president of the YMCA, and county chairman of the local chapter of the American Red Cross.

He was called to the company's general offices in Dallas in 1937 to take the position of advertising manager, and in the same year was made vice president in charge of advertising. He has been active here in the Dallas Rotary Club, and the Dallas Advertising League. In 1939, he was chairman of the Dallas committee for Finnish relief. He is a Mason and a member of Sigma Delta Chi national professional journalistic fraternity.



Guy O. Dill, vice president of the Anniston Electric Company, Inc., of Anniston, Ala., is shown above with the 12 Westinghouse water heaters he sold to a textile company for installation in homes of some of its officials and other employees. The textile firm pays the current costs, and thus its purchase of the 12 heaters demonstrates that its officers appreciate the economy and other benefits of electric water heating, according to Mr. Dull

New Range Wiring Policy in Chattanooga

A change in the free wiring policy of the Chattanooga Electric Power Board for electric range and water heater installations went into effect on September 1. After that date, purchasers of ranges and water heaters will pay a portion of the installation cost heretofore assumed completely by the board.

The new policy requires that dealers make a deposit with the power board of $20 towards the installation of ranges and $12.50 on the installation of water heaters sold. At the end of every quarter, the board will return to the dealers $5 for every range installed and $2.50 for each water heater.

C. Bert Osborne, in charge of the power board's appliance dealer coordination, explained that this was required so that dealers will include enough in the sales price to pay carrying charges on the installation cost. Previously the board had paid up to $40 on installation of ranges and $35 on installation of water heaters. Now the board will be standing up to $25 on the installations, Mr. Osborne stated.

At left is Oscar Greene, city salesman for Southwestern Public Service Company, Roswell, New Mexico, receiving from John G. Comer, Westinghouse merchandising manager of Zork Hardware Company, El Paso, a check for $50 for the best sales presentation on Westinghouse electric ranges in the southwestern district. A like award was made to Fred Hopkins, of Swann-Schulle Furniture Company, Austin, Texas, for the best sales presentation on Westinghouse refrigerators in the same district. This was the climax to a sales training program for dealers' salesmen, conducted on a national basis by Westinghouse Electric and Manufacturing Company. The training program made use of phonograph recordings of the salesmen's talks to prospective customers.

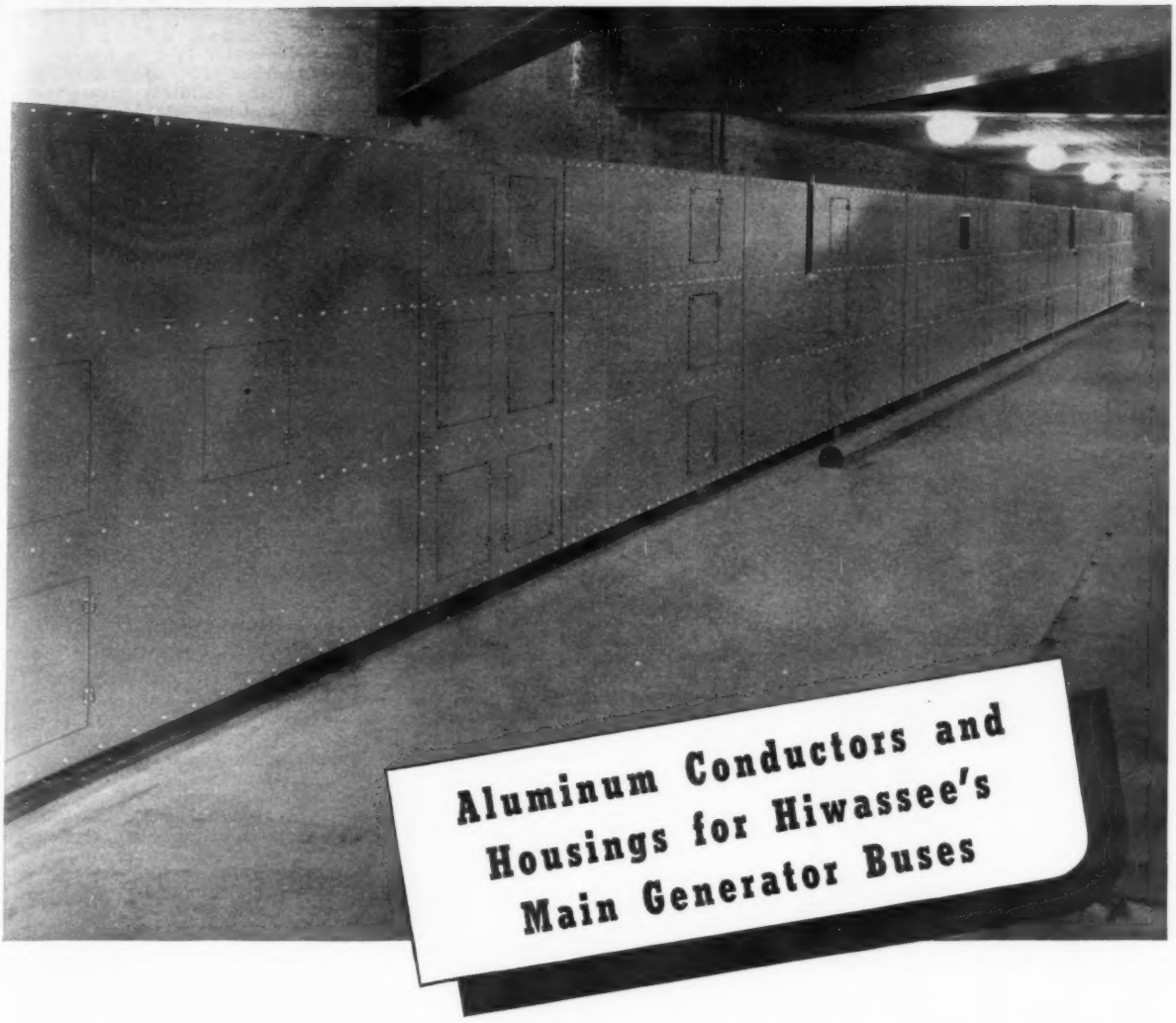
Florida Power Starts Expansion Program

The Florida Power Corporation will start at once the construction of a $1,000,000 addition to its Bayboro power plant which will house two boilers capable of producing 175,000 pounds of steam per hour, according to an announcement by A. W. Higgins, president of the company. The new structure—it is to be completed early in 1941—is the beginning of an expansion program calling for the outlay of about $3,000,000, it was stated.

A 200-foot stack identical with the one on the existing power plant will rise from the new building but instead of being set up on a foundation starting from grade, it will be suspended on especially-designed supports at the roof level so as to increase interior space. The plant has been designed to permit enlargement of the structure when it is needed.

Construction of the new unit will assure sufficient output "to meet the present power demands of St. Petersburg and make it possible almost to triple the kilowatt capacity of the plant in the near future to provide for the growing power needs of the community," it was stated by President Higgins.

A further safeguard is provided by a system of interconnections with other power companies.



The 3200-ampere generator bus at T.V.A.'s Hiwassee Dam project uses Alcoa channel conductors and is carried in this Aluminum housing. Because Aluminum is nonmagnetic, the heating effect of magnetic materials under similar load conditions is avoided. Buses can carry larger loads without overheating.

The housing is made of Alcoa Aluminum sheet, riveted in sections in the shop and then bolted together on the job. It has three compartments, providing phase separation for the three Aluminum conductors. Each conductor is made up of two 6-inch Aluminum channels placed to form a hollow square, and the bus joints are welded.

Aluminum housings and buses are easily fabricated from standard structural materials. Aluminum construction is strong and neat, and needs no protective coating of paint. Its lighter weight places less burden on supports, thereby simplifying construction and often reducing costs. ALUMINUM COMPANY OF AMERICA, 2164 Gulf Building, Pittsburgh, Pa.

Reg. U.S. Pat. Off.
ALCOA
ALUMINUM

MANUFACTURERS' News

Westinghouse Washers Feature Streamlining

New streamlined design and larger tubs for larger loads are two features of the new 1941 Westinghouse washer line. Capacity of the tubs in all washers in the line has been increased, resulting in speedier handling of large washings as well as giving the models a more massive appearance. The new design and use of additional chrome trim add to the eye-appeal of the washers.

The Emperor is the feature model of the 1941 Westinghouse washer line. The dome-type lid, additional use of chrome trim, and a Time Dial which eliminates guesswork by shutting off the washer automatically, are features of the new model.

The entire laundry equipment line has been made more compact, now consisting of five washers, a spinner-dryer washer, and two ironers. The washer line is headed by the Emperor, which is equipped with a time dial which automatically shuts off the washing operation, eliminating guess-work.

The Emperor and one other washer, the Master, have been improved by use of the "turtle-neck" tub design. All have a dome-type lid which adds to the over-all appearance of the washers. Prices of the five washers range from $49.95 to $99.95, F.O.B. Mansfield. In addition to the regular models, gasoline engine-driven models also are available in various price ranges.

In addition to announcing the new line, Mr. Newcomb, manager of the Westinghouse household refrigeration and laundry equipment department, outlined a complete new merchandising program on laundry equipment. The plan, which is focused around retail sales demonstrations, comprises magazine advertising, retail sales training material, and a direct mail plan for dealers to invite prospects into their stores to see the new line. Feature of the program is a "Value Visualizer," a new easel presentation for use by retail salesmen.

"Wirometer" for Computing Common Wiring Problems

A pocket-size wire calculator, called the "Wirometer," for use in computing wiring problems in accordance with the 1940 National Electrical Code, has been developed in connection with the G-E Flamenol small diameter building wire campaign, it has been announced by the General Electric appliance and merchandise department, Bridgeport, Conn. The Wirometer provides a quick method for arriving at code requirements.

Information which may be obtained quickly by the use of the device includes: conduit fill of all approved types of building wires, including wires of different sizes in one conduit; current capacities for wires when more than three wires are run in one conduit; corrections in current-carrying capacity for ambient temperatures over 30 degrees C.; and voltage drop for eight distribution systems.

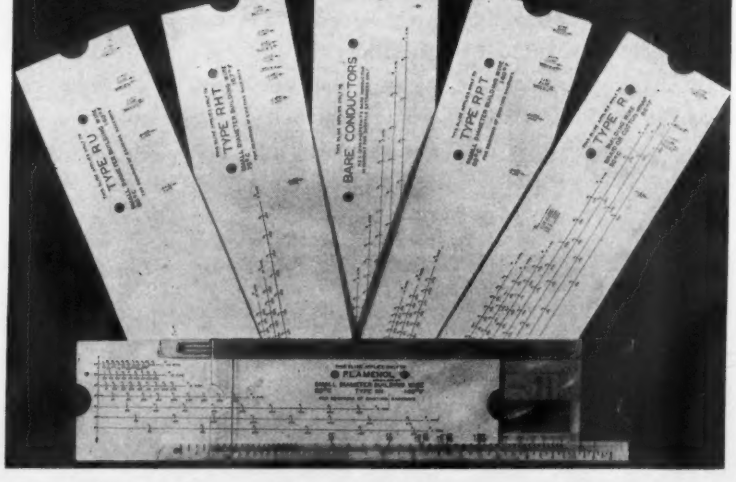
The Wirometer is 8 inches long, by 2-3/8 inches wide, and is made up of two sliding celluloid covers and six interchangeable cardboard slides. One side of the Wirometer enables voltage drop to be calculated for eight of the most widely used distribution systems. Wire sizes which can be used in the calculation range from No. 16 AWG to No. 4/0 AWG with distances from 10 to 1000 feet. The other side of the Wirometer is designed for determination of the number of wires allowed in conduit, the resultant current values, and also correction for ambient temperature.

While it is possible, of course, to determine the maximum number of conductors of the same size allowed in a conduit by referring to tables in the 1940 N.E. Code, it is difficult to calculate conduit fills when a number of conductors of different sizes are installed in one conduit. The Wirometer makes calculations of this type quick and simple. Wirometers are available from G-E merchandise distributors.

Eureka Offers Special 30th Birthday Combination

The Eureka Vacuum Cleaner Company, Detroit, Mich., founded thirty years ago this month, announces Eureka's 30th Birthday Special, an unusual merchandise offer backed up by a strong promotion campaign. A campaign that will get for Eureka dealers a greater share of the peak fall market for vacuum cleaners. The merchandise combination and promotion were proven in test cities and their traffic, sales and profit possibilities have been established by Eureka dealers.

In combination with the new 1940 Eureka Swirlator Action cleaner a beautiful Vaculator coffee brewer set is being offered at a bargain price. The combined items have a recognized value of $55.70 and will be promoted at a 30th Birthday Special



General Electric's new wire calculating rule for contractors.

ERNEST T. LOYD

Southeastern Representative of the Manufacturers whose Products are listed below, will display them at the Convention of the N. E. C. A. at Jacksonville, October 21-22-23.

YOU ARE CORDIALLY INVITED TO VISIT HIS EXHIBIT.

MALLEABLE IRON **KILLARK CONDUIT FITTINGS** CADMIUM PLATED

SLB VANDEVENTER and EASTON AVENUES

FB

LB

L-15

VUA

VUC

GEUE

GRS

KILLARK ELECTRIC MANUFACTURING CO. ST. LOUIS, MO.

Levolier—*the dependable switch for fluorescent lighting*

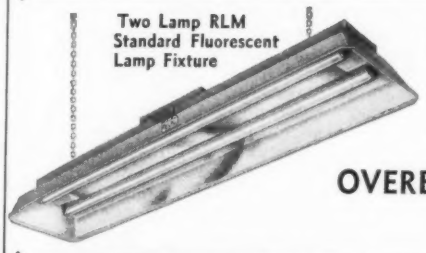
No. 41

Designed to control either 110 or 220 volt installations. Operate from fixture pan or canopy. No pitting, arcing or heating making for long service.

No. 41, Single pole 6 amp. 125 v, 3 amp. 250 volts
No. 1010, Single pole 10 amp. 125 v, 3 amp. 250 volts

No. 1010

McGILL MANUFACTURING COMPANY, VALPARAISO, INDIANA



INDUSTRIAL AND COMMERCIAL LIGHTING EQUIPMENT

OVERBAGH & AYRES MFG. CO.
411 S. Clinton St.,
Chicago, Ill.

PAINE PRODUCTS SPEED-UP INSTALLATIONS • CUT COSTS

FIG. 123

FIG. 123—PAINE STANDARD SPRING WING TOGGLE BOLTS—available in 7 standard sizes and 8 bolt head styles to meet all requirements. Wings automatically spread to anchoring position when head is slipped through bolt hole. The ideal anchors for hollow walls and ceilings.

FIGS. 900 AND 901—PAINE EXTRA STRENGTH LEAD ANCHORS—make installations in Brick, Marble, Cement and Stone walls, floors and ceilings simple and easy. Will not fracture fragile material. They provide secure anchorage that prevents movement in any direction.

FIG. 365—PAINE "SUDDEN DEPTH" CARBOLOY-TIPPED DRILLS—for drilling holes in Tile, Slate, Stone, Concrete, Brick, Marble and Mosaic. The Carboloy-Tipped Point has a diamond-like hardness that holds edge 50 times longer than ordinary drills. Can be used in any portable power drill or brace and bit.

FREE—NEW PAINE TOGGLE BOLT CLAMP, that takes all of the headaches out of toggle bolt installation and cuts installation time ½, to any Electrical Contractor visiting our Booth.

FIG. 900

FIG. 910

FIG. 365

THE PAINE COMPANY 2945 CARROLL AVE. CHICAGO, ILL.

J. I. Paulding, Inc.

New Bedford, Mass.

Manufacturers of

PORCELAIN, BRASS & BAKELITE ELECTRIC WIRING DEVICES

ERNEST T. LOYD

ERNEST T. LOYD

Electrical Manufacturers Sales Agent
Covering six southeastern states

Office and Warehouse

198 Walton St., Atlanta, Ga.

R. E. JONES, SR.

price of $35.88. The Vaculator set nationally advertised has an established value of $10.95 and includes a complete service tray, 3 crystal relish dishes, cream and sugar set, a bronze finish service tray and an 8-cup Vaculator set complete with Underwriters approved stove. The Eureka Floor Model cleaner was built to sell for $44.75.

An aggressive, strong promotional campaign, including newspaper ads, special window trim and posters, consumer dodgers and cooperative ad layouts and mats, will be put behind this 30th Birthday Special, enabling dealers to capitalize on the volume and profits that this combination will produce. Complete details, prices and discounts, on this special offer, are available upon request.

Washer Window Prizes Offered by Hotpoint

Hotpoint retailers who are taking advantage of the National Washer-Ironer Week Promotion have an opportunity to win double prizes for attractive window displays.

H. E. Warren, manager, Hotpoint Home Laundry Division, has announced that any dealer's window which wins a prize in the contest sponsored by the National Washer & Ironer Manufacturers' Association, will receive a duplicate cash award from Hotpoint provided the window displays Hotpoint home laundry equipment exclusively. To help their retailers build interesting displays, the Hotpoint company is making available a free package of window display material containing the special pieces produced by the National Washer & Ironer Manufacturers' Association.

To encourage distributors and distributor salesmen to give all possible assistance to their retailers in building good windows, the National Washer & Ironer Manufacturers' Association is also offering a cash prize to the distributor salesman who sponsors the winning dealer. Hotpoint will also duplicate this prize to the distributor's salesman if the dealer's window wins and is all Hotpoint.

Silex Commercial Catalog Complete, Easy to Use

Announcing its desire to help distributors make easier and better sales, The Silex Company, Hartford, Conn., has condensed its new catalog of restaurant equipment. In this new, attractive, two-color catalog prices have been listed directly opposite each model. Ample information has been included to enable any salesman to decide the proper size unit for any customer.

The new four-unit Terrace model, in gas and electric, is included. This model is designed for those people who have considerable demand for coffee, but limited shelf room for equipment. The always popular step-up Terrace design in the four-unit size will meet this demand for compactness and capacity.

Consumer folders covering the commercial line have been prepared and are now available to all dealers. Catalogs will be sent on request by The Silex Company, Hartford, Connecticut.

Cold Cathode Fluorescent Illumination Bulletin Issued

A new 24-page bulletin for electrical engineers, contractors, lighting engineers, architects, dealers and wholesalers, explaining in detail the principle and advantages of the cold cathode method of fluorescent illumination for industrial, commercial and home lighting, is now available from the National Transformer Corp., Paterson, N. J.

Complete information is given on how to figure illumination in terms of fluorescent lighting—recommended foot candles for every type of installation — graphs and charts showing foot candle readings at various distances from the fluorescent lamps—data on National Multiple Circuit Voltage Amplifiers, sockets, housings and fluorescent lamps used in the installations—plus other general information necessary to understand, sell and install cold cathode fluorescent lighting systems.

Easy Presents New Models to Distributors

In an exciting "election campaign" atmosphere the Easy Washing Machine Corporation last week unfolded its 1941 line and sales program to the Easy sales organization and distributors. The meeting, held September 12 and 13 in the Onondaga Hotel, Syracuse, N. Y., was attended by the complete Easy sales organization and 74 distributor representatives from coast to coast who enthusiastically endorsed the entire program.

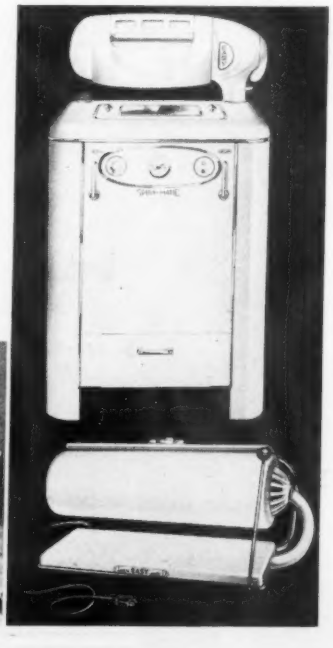
The most dramatic part of the meeting was the announcement of a new 1941 washer line, including a revolutionary new type of washer and a new sterilizing lamp that kills germs while clothes are being washed. In presenting the program, J. J. Nance, general sales manager, announced, "This program is the first complete program in the washer industry. In every phase of this program we have emphasized step-up selling. We have planned the line to help our Easy dealers get a higher unit-of-sale and to increase sales in every price class."

The line consists of 4 series of washers to blanket each of the four price classes. Each series includes a standard and deluxe model. The Special series, aimed to compete in the low-priced class, features a $49.95 leader model. The Spiralator series includes two "big-package" Spiralator washers with bigger tubs, bowl-bottom, sediment trap and many other features to sell in the popular "around $70" class. And in the top wringer class, there is the new Spiramatic series which is a brand new idea in washers, combining many automatic features in a washer of cabinet design.

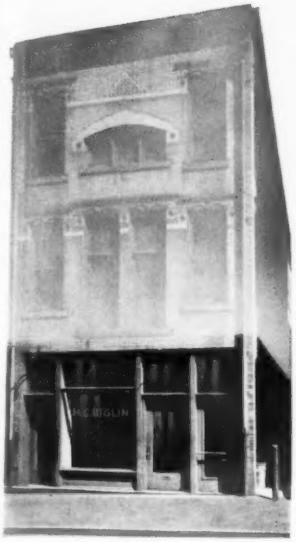
At the top of the line is the Spindrier series with new Spindrier models. The line is designed and named for step-up selling. There is a logical, visible step-up from series to series; when the prospect has decided the series she intends to buy, the retail salesman can sell-up from the standard to the deluxe model.

The new Spira-matic washer is cabinet in design, table top and sink high to fit the modern step-saving kitchen. It is styled to match range and refrigerator. It is of double wall construction with the washing tub being mounted in rubber inside the washer cabinet. It contains many automatic features such as automatic over-load switch, automatic

(*Continued on page* 69)



Left to right, below, H. P. Nelligan, vice president and general counsel; J. C. Nelson, president; and J. J. Nance, general sales manager; all of Easy Washing Machine Corp., at the speaker's table during a breakfast meeting for the Easy sales organization. At right, above, a newcomer to the Easy line: the DeLuxe model of the Easy Spira-matic series, a cabinet type washer with many special features. Right, below, the new 1941 Easy Porta-matic ironer.



1917

Office and Warehouse occupied 850 square feet.

1940

Office and Warehouse Space Over 14,000 square feet

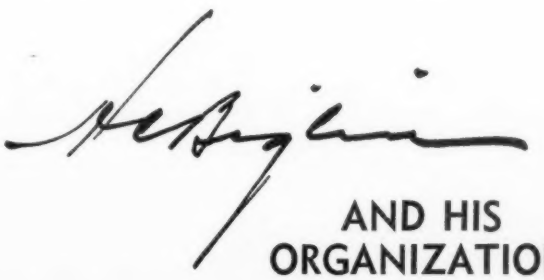
By Keeping Pace Yesterday We are Keeping Faith Today!

Since a modest beginning in 1917, the Biglin Organization has played an aggressive part in the electrical progress of the South. To keep pace with this progress today Biglin has a background of an experienced organization who anticipate, rather than await, the requirements of its customers.

Covering the South and serving the Contractors through the Jobbers for nearly a quarter century, the Biglin organization welcomes the opportunity to extend you a cordial invitation to visit Booth No. 52 at the Jacksonville Convention of the N.E.C.A. And, most of all, we hope sincerely that your visit to Jacksonville will be both enjoyable and profitable.

177 HARRIS ST., N. W.
ATLANTA, GEORGIA

Representating Leading Electrical Manufacturers. Complete Warehouse Stocks.



AND HIS ORGANIZATION

"For Brighter Days to Come"

BEL-SUN-LITE

The Trade Mark identifying better, more efficient lighting equipment of high quality. It is to be found on special and standard lighting equipment manufactured by the Belson Manufacturing Company for:

Theatres
Stages
Auditoriums
Stores
Offices
Industrial Interiors
Floodlighting, etc.

Our engineering department is always ready to help you solve your lighting problems involving both incandescent and fluorescent illumination.

Your inquiries will be welcomed by our Southern Representative:

Harry C. Biglin
177 Harris St. N. W.
Atlanta, Ga.

BELSON MANUFACTURING COMPANY

General Offices and Factory

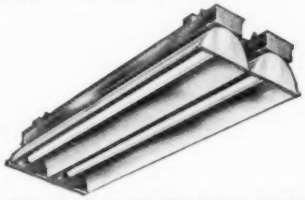
800 South Ada Street Chicago, Illinois

WIREMOLD has Plenty good "dope"!

LINE-O-LAMPS

INDUSTRIAL FLUORESCENT LIGHTING

Available with or without concentrating or distributing type Alzak reflectors. Wired or unwired for any size or number of lamps. Wired units equipped with Wiremold Controls.



WIRED OR UNWIRED UNITS

Low cost, high efficiency multiple units for industrial use, show windows, etc. For 18", 24", 36", 48" lamps, with distributing or concentrating Alzak reflectors and Wiremold Controls.

"PLUGMOLD"
Multi-Outlet Assembly

For homes, offices, stores, display rooms and industrial buildings. Permits location of outlets exactly where needed. Also permits relocation with minimum effort and expense. Two sizes: — No. 2100 with capacity 6 No. 12 wires; No. 1900 with capacity 2 No. 14's.

"PANCAKE"
OVERFLOOR WIRING SYSTEMS

Strong, flat raceway section that is trip-proof on floors for office and factory use. Available with complete line of fittings for light, telephone or limited power.

Four sizes of raceways with complete series of fittings. Providing an economical and efficient method for wiring of commercial, industrial and public buildings, where extension to or relocation of wiring is desirable over a period of years. Easily installed on the surface for re-wiring of old buildings.

★ WIREMOLD ENGINEERING DATA SHEET SERVICE ★
★ WIREMOLD ENGINEERING DATA SHEET SERVICE ★
DR. NO. ES. 157
FLUORESCENT LAMP INSTALLATION FOR
FACTORY ASSEMBLY OR INSPECTION ROOM

TO HELP ALERT CONTRACTORS *Quickly* MEET NATIONAL DEFENSE NEEDS . . .

- *for* WORK-SPEEDING FLUORESCENT "DAYLIGHT"
- *for* FASTER, LESS COSTLY REWIRING of OLD BUILDINGS
- *for* TIME-SAVING, PRODUCTION-SPEEDING IDEAS IN INDUSTRIAL WIRING

Wiremold Raceway and Fittings are listed by Underwriters Laboratories, Factory Mutual Laboratories and Canadian Engineering Standards Association.

Your Business Builder

THE WIREMOLD, CO., HARTFORD, CONN.

ADEQUATE WIRING SERVES AND SAVES

WIREMOLD

LIGHTING and WIRING EQUIPMENT
LISTED BY UNDERWRITERS' LABORATORIES, INC.

ELECTRIC Thermador HEATERS

VISIT Harry C. Biglin's Booth No. 52 while attending the N. E. C. A. Convention and see this display of Thermador Electric Heaters.

"Seven Leagues Ahead"

•

THERMADOR ELECTRICAL MANUFACTURING COMPANY

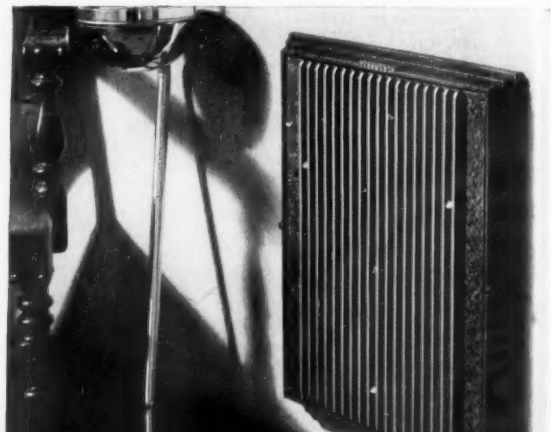
5119 So. Riverside Drive
Los Angeles, Cal.

177 Harris St., N. W.
Atlanta, Ga.

•

For 25 Years the Leader In Electric Heating Appliances.

Bathroom Heater Type R



Master Duty Wall Insert Type W-M

Examine The Advertising Pages of This Issue of

ELECTRICAL SOUTH

very carefully before going to
THE N.E.C.A. CONVENTION AT JACKSONVILLE

Study the trade marks and trade names of the leading electrical manufacturers whose advertising appears in this issue.

WIN A PRIZE

Full Information at

ELECTRICAL SOUTH'S Exhibit, Booths No. 5 and 6

Easy Models Introduced

(*Continued from page* 64)

timer. In addition it includes many new features never before found on any washer, such as the Steril-Glo lamp, which emits ultra-violet rays and is similar to the type of lamps used in hospitals for sterilization. It is mounted inside the tub and kills disease germs while clothes are being washed, sterilizing them and purifying them with sun-like rays.

Barney Finn, advertising and sales promotion manager, announced that the advertising and sales promotion plans include a national advertising campaign in Saturday Evening Post and women's and household magazines, and a brand new idea in newspaper advertising.

Kelvinator Establishes Sales Record in 1940

The greatest sales record in Kelvinator's long history will be hung up in 1940, it has been announced by Frank R. Pierce, Kelvinator's general sales manager, who says that business during this record-smashing year has been 2¼ times of what it was in 1939.

"With dealers all over the country reporting a greater public acceptance for our product than ever before," Pierce stated, "this tremendous increase in Kelvinator business is highly significant, as the refrigeration industry as a whole has experienced only a 35.1 per cent gain over 1939. Translated into other terms, this means that Kelvinator's percentage share of the entire electric refrigeration industry has almost doubled.

"Both small and large retailers," Pierce continued, "have shared in the marked uptrend in business, with many dealers in metropolitan areas as well as small towns reporting triple and quadruple 1939 volume.

"At the outset of the model year," he explained, "we announced that our new 1940 manufacturing and selling program would enable us to double our volume. The result has been even better than we anticipated."

Pierce reported that the 1940 program was not one of mere price cutting, as has been charged in some quarters. "It was," he said, "a broad plan to eliminate the many ills besetting the refrigeration industry and that over-pricing represented only one of these ills. Others included: A profusion of models, which created stocking and selling problems; no logical justification for price differences between models; too many dealers in a given market; the lack of uniform, delivered-in-the-kitchen prices that could be advertised nationally; bad price-cutting practices; outmoded distribution methods; and too much of what dealers termed sales-promotion 'hooey'."

Pierce pointed out that not only had this program produced record-breaking sales, but that it had brought about an exceptionally high average unit-sale price of its refrigerators.

"Although some experts predicted that the average price of refrigerators sold would take a nosedive," he said, "our dealers' reports show that 80 per cent of the sales made this year have averaged $160.23."

Gold-Plated Fans Awarded To G-E Early Birds

Back before the buds began to burst, in fact when there was considerable snow still on the ground and frost in the air, the fan sales section of the General Electric appliance and merchandise department devised a spur which would encourage sales effort all along the line. The electric fan business is funny. The season is short. It may be either a feast or a famine. Even the advertising is scheduled in such a way that it can be released only by the thermometer.

G-E fan managers called their idea an "early bird campaign" and its object was to sign up as many fan dealers as possible long before the steam began to rise from city pavements. Prizes were offered to the leading district appliance sales manager and fan specialist in the country, to the three best distributors' salesmen, and to the leading distributorship in each district. Those prizes, just awarded, consisted of 19 gold-plated General Electric quiet fans; that is, everything visible was gold-plated except the fan blades. Being aluminum, they had to be content with bronze instead. The winners were:

Best three distributor salesmen: G. H. Hartman, Jr., of Raub Supply Co., Lancaster, Pa.; A. W. Pigue, of Graybar Electric Co., Cincinnati; H. G. Craft, of Mill Power Supply, Charlotte, N. C.

Best district manager of General Electric: T. B. Allen, of Minneapolis; best G-E fan specialist, D. C. McCune, of the same office.

Distributorships in the South which won fans included: Graybar Electric Co., Atlanta, Ga.; Perry-Mann Electric Co., Columbia, S. C.; and the General Electric Supply Corp. branches in Nashville, Tenn., and Dallas, Texas.

Kelvinator sales are 2¼ times last years, Frank R. Pierce, Kelvinator's general sales manager, points out at a staff meeting. This, he says, compares with an industry increase of 35.1 per cent and means that Kelvinator's percentage share of the refrigeration industry has almost doubled.

News About People—

On September 16, at The Engineers' Club, New York City, a dinner and reception was tendered **John Delmar Underhill,** vice president of The Okonite Company, Okonite-Callender Cable Co., Inc., and Hazard

J. D. Underhill

Insulated Wire Works, by his fellow employees, in celebration of his completion of 50 years of service with the company. Fifty-three Okonite men, including managers and representatives from all sales offices, attended the celebration, which was presided over by **President F. C. Jones,** as toastmaster.

In addition to the many tributes from his associates to the outstanding qualities that have contributed

W. H. Barnett J. M. Harsch W. R. Schofield

so much to Mr. Underhill's success, many telegrams from men in the industries which Okonite serves, and from other wire and cable companies as well, testified to the high regard in which "Del" Underhill is held by all who know him. Appropriate gifts were presented by the Okonite Company and by his associates.

* * *

D. W. Russell, president of Airtemp Division, Chrysler Corporation, announces the appointment of **Ward H. Barnett** as merchandising manager. In his new assignment, Mr. Barnett will promote and coordinate the rapidly expanding air conditioning and heating sales of the Airtemp Division.

Mr. Barnett first came to the Chrysler Corporation with the purchase of Dodge Brothers in 1928. Following important sales and promotional assignments in various divisions of the Corporation, he was made a sales director of the Plymouth Division in 1939, where he served until transferred to his present position.

* * *

W. Richison Schofield, formerly chief engineer of Leeds & Northrup Company, Philadelphia, Pa., has recently been appointed director of engineering. **John W. Harsch,** assistant chief engineer, has been advanced to chief engineer, and Mr. Harsch's former position has been filled by the promotion of **John F. Quereau.** Mr. Schofield joined Leeds & Northrup in 1916 and since 1928 has held the position of chief engineer. An authority in pyrometry and automatic control, he holds important patents in these fields. Mr. Harsch joined Leeds & Northrup in 1924, and in 1928 became assistant chief engineer. He is largely responsible for the design of the Homo tempering and Homocarb carburizing furnaces. Mr. Quereau has been with Leeds & Northrup since 1929 and is the inventor of a number of thermocouple and resistance thermometer devices.

* * *

Reliance Electric & Engineering Company is opening a sales office in Houston, Texas, with **Frank A. Denison, Jr.,** as district manager, it is announced by **James W. Corey,** vice president in charge of sales. A native Texan, Mr. Denison's home, prior to joining Reliance in July 1936, was Waco, Texas. He first attended the University of Texas, subsequently transferring to the University of Michigan where he graduated in mechanical engineering in 1936.

Mr. Denison has been a member of the sales engineering staff in Detroit since early 1937.

* * *

Two new appointments at the main office of the American Steel & Wire Co., Cleveland, have been announced by **H. J. Jordan,** vice president in charge of operations.

Elmer E. Legge has been appointed assistant director of research for the company and **Leonard F. Peskin** has been appointed technical engineer. Both men are transferred from Worcester, Mass., where Mr. Legge was district director of research for the company and Mr. Peskin was engineer in charge of transmission. They are both well-known in technical, engineering and metallurgical circles throughout the country.

Elmer E. Legge

L. F. Peskin

* * *

Russell W. Keiser, 423 Peachtree Street, N. E., Atlanta, Ga., has been appointed sales representative of the Cold Cathode Division of the National Transformer Corp., Paterson, N. J., for the entire territory of the United States east of the Rockies. Mr. Keiser has formed a new company, the Cold Cathode Illumination Co.,with headquarters at the above Atlanta address, and will concentrate his entire efforts on the sale of Cold Cathode Fluorescent Amplifiers, lamps and housings to electrical wholesalers and contractors.

R. W. Keiser

* * *

Carl L. Westin has been appointed Southwestern District Service Manager for Westinghouse Electric & Mfg. Co., according to announcement by **H. F. Boe,** manager of the Westinghouse Service Department, which includes 37 service plants throughout the country.

Carl L. Westin

With headquarters in St. Louis, Mo., Mr. Westin will be in charge of service plants in St. Louis; Houston, Texas; Denver, Col.; and Kansas City, Mo. Since 1938 he has been assistant Northwestern District service manager at Chicago. Mr. Westin has been in the Service Department since 1921 and has been associated with Westinghouse for 28 years.

Meet Six Old Friends
Who Stand for Quality

"THE DONGAN LINE SINCE 1909"

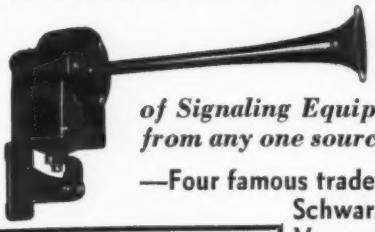
The "Complete Line" of

Controls for Fluorescent Lighting

Dongan also builds complete lines of transformers for Bell Ringing . . Signaling Power step down . . Control . . Mercury Vapor Lighting . . Oil & Gas Burner ignition Neon & Luminous Tubes & Toys. Special transformers to customers requirements.

Dongan Electric Mfg. Co.

The Master of Industrial Noise



The Most Complete Line of Signaling Equipment available from any one source.

—Four famous tradenames, Faraday, Schwarze, PR & De-Veau are your Guarantee of Top Quality and carefree performance.

Stanley & Patterson
DIVISION
OF
SCHWARZE ELECTRIC CO.

Service Knobs, House Brackets, Secondary Racks, and a complete line of **Insulators** to take care of all your wiring needs. Designed and made to give your customers economical, trouble-free service combined with the utmost in safety, this line of Insulators offers you the greatest value for your insulating dollars.

PORCELAIN PRODUCTS, INC.

For eight years Mello-Chime has pioneered with all outstanding improvements in the chime business. Now Mello leads again with the first new all-plastic models.

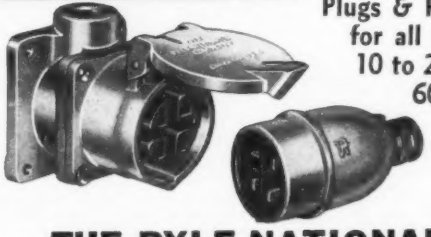
There is no vibration in plastic. All tendency towards a metallic sound is removed. Apollo Aristocrat shown retails at $6.95. Other models from $1.00 to $44.50.

MELLO-CHIME & SIGNAL CO., INC.

PYLETS

Conduit Bodies
Vapor proof Lights
Explosion proof Fittings
Circuit Breakers

Plugs & Receptacles for all purposes 10 to 200 Amp 600v.



THE PYLE-NATIONAL CO.

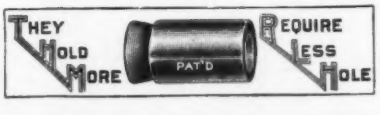
Screw Anchors

Expansion Bolts

Toggle Bolts & Other

Fastening Devices

Ackerman-Johnson
EXPANSIVE
SCREW ANCHOR



We manufacture fastening devices exclusively and our quarter century of experience in this field is at your disposal.

Southeastern Representative

GEORGE R. KOELN & COMPANY

Office and Warehouse

376 NELSON STREET, S. W. ATLANTA, GA.

ASPLUNDH

ECONOMICAL LINE CLEARING

JENKINTOWN, PENNSYLVANIA, OGONTZ 3750

NATIONAL DEFENSE DEMANDS
UNINTERRUPTED SERVICE
FOR
LIGHT, POWER AND COMMUNICATIONS

LET ASPLUNDH

TREE EXPERTS GO TO THE FRONT FOR YOU IN THE CONTINUOUS CAMPAIGN FOR THE SMOOTH TRANSMISSION AND DISTRIBUTION OF ELECTRICITY.

BRANCH OFFICES

CHICAGO, ILL. RANDOLPH 7773	PITTSBURGH, PA. ATLANTIC 9798	ALEXANDRIA, VA. ALEXANDRIA 3581
BINGHAMTON, N. Y. BINGHAMTON 4-5314	WASHINGTON, D. C. SHEPHERD 6115	NEW CASTLE, PA. NEW CASTLE 2285
COLUMBUS, OHIO ADAMS 5432	BALTIMORE, MD. PLAZA 7656	RUTHERFORD, N. J. RUTHERFORD 2-7434

LINE CLEARANCE

New Electrical Products

Multibreaker Panelboard

Square D Company, Detroit, Michigan, announces the new type MH Multi-breakeR Distribution Panelboard. The Multi-breakeR principle of simplicity in circuit breaker construction has now been extended to include 100 ampere, 230 volt, branch circuit capacity for power and lighting distribution. Thus circuit breaker protection for power and light distribution can be provided at a cost little more than that of fused circuit protection.

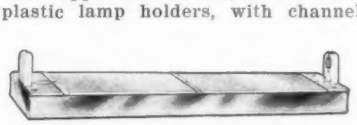
Branch breakers are furnished in 15 to 100 ampere capacities—1, 2 or 3 poles, for 115 and 230 volt, single

phase and 3 phase, a-c systems. Since all breakers used in these panels are common trip, (that is, an overload on any pole will cause all poles to trip), they are suitable for use on ungrounded systems, and single phasing of motors protected by these circuits is prevented.

The panels are completely dead front—no live parts are exposed even when restoring the service after an overload or short circuit. MH panels are unusually compact, and therefore, on rewiring jobs, the use of MH panelboard interiors in existing panel boxes will provide the additional circuits made possible by the use of the new thin wall wire.

Wiremold Fluorescent Units

Available in unit lengths for any specified size and number of fluorescent lamps, with or without Alzak Reflectors of either concentrating or diffusing types. Wired units are now supplied as standard with white plastic lamp holders, with channel



and covers aluminum finish. New Wiremold controls, designed to fit within the channel make a completely self-contained installation. Available fittings include hangers for ceiling, wall or special applications. For further details write The Wiremold Company, Hartford, Connecticut.

New G-E Wiring Devices

A number of new wiring device items, including outlets, caps, switches, and sockets, some for special uses on farms, some for temporary decorative lighting, and others for industrial applications, etc., for other outdoor uses have been announced by the appliance and merchandise department of the General Electric Company, Bridgeport, Conn. The devices include a polarized twin convenience outlet and cap, new weatherproof sockets with a metal enclosure, a new pin-type weatherproof socket, and several switches and outlets on molded box covers for insulated systems.

The new polarized twin convenience outlet (GE3305) is two-wire, 20-ampere, 250-volt, and will accommodate two caps (GE3306) at the same time. The caps, rated similarly, of composition, with cord grips, have a smaller overall diameter than previous 20-ampere caps. The outlet has plaster ears and four binding screws, and it fits standard twin convenience outlet plates. The face design matches the standard Uniline plate design.

The new G-E weatherproof sockets have cast enclosures and were designed expressly for outdoor use. Sturdy, compact, and of pleasing appearance, two types (GE3329 and GE3330) have straight enclosures with a ⅜ and ½ inch thread respectively, while another socket (GE3332) has a 90-degree enclosure with a ½-inch thread. All three are suited for industrial installations, as features include a one-piece die-cast non-corrosive metal hood with shade-holder with permanent natural white metal finish, porcelain interior, and set screw for tightening and support.

The pin-type Textolite weatherproof socket (GE3319) is designed for the speedy installation of festoon lighting or decorative lighting installations, such as those on streets, at carnivals and fairs, for Christmas trees, etc. No stripping, splicing, soldering, or taping is needed to connect this socket to the conductors. The wires are laid in prepared grooves and the cap screwed on.

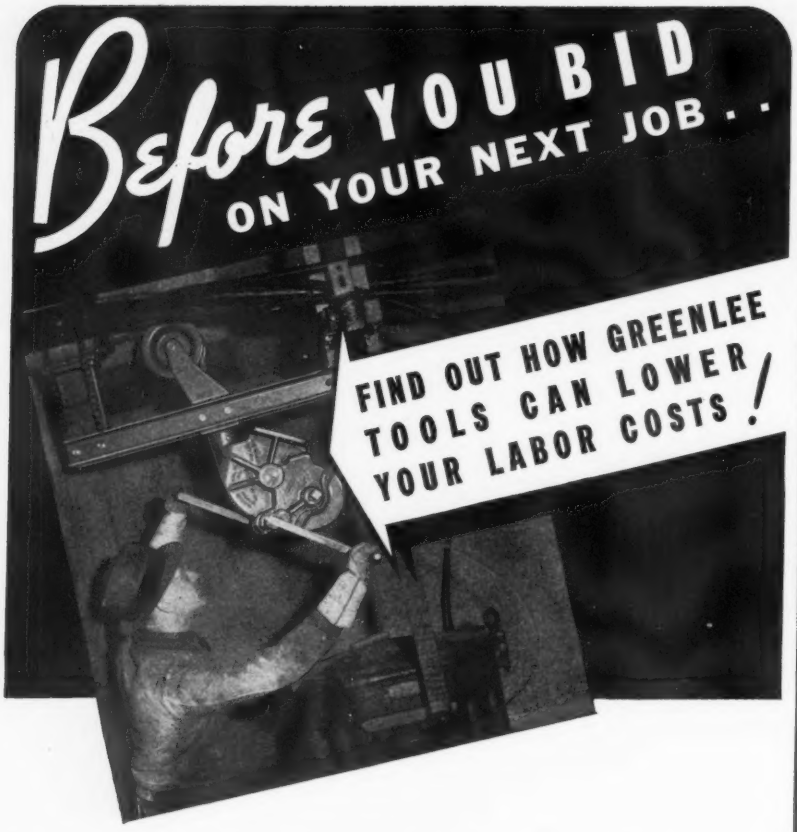
The new G-E switches and convenience outlets mounted on brown molded box covers have been especially designed for surface wiring jobs where an insulated cover is required. Many applications for them will therefore be found in farm wiring.

Adalet Conduit Fittings

The new Form 37 "Adalets" have just been announced to the trade. The cross-section illustration shows the smooth curves on the inside of the fitting . . . the complete absence of right-angle turns that crack and cut the insulation. There is no mechanical abrasion.

The radii of the conduit hub bell-mouth curves is in accordance with the wire manufacturers' performance specification mandrel. The bell-mouth curve prevents sharp kinks in wires or cables on all right angle turns. In addition to the safety factor, this interior design speeds up

INTRODUCING THE
VERSITAP
ONE CONNECTOR
FOR USE AS A TEE, LINK, CROSS OR PARALLEL CLAMP...TAKES WIDE RANGE
AT LAST SOMEBODY WORKED IT OUT... HIGH ADAPTABILITY, LOW PRICE!
Keeps connector stocks small . . . Installed with a wrench, compact . . . Prevents cable bending on offset taps . . . High strength, conductivity copper alloy . . . Ten sizes cover any of 814 joints.
TYPE QPX
PAT. PEND.
1—Bottom plate encloses bared section of run.
2—Bolt threads caught, tap is inserted.
3—Tightening two bolts completes the joint.
HAVE YOU CATALOG 41?
—for copies write to
BURNDY ENGINEERING CO., INC.
459 East 133rd Street, New York City.
A SINGLE VERSITAP HANDLES THESE CONDUCTOR SETUPS
SEE YOUR WHOLESALER ABOUT
BURNDY
CONNECTORS



Before you bid on the next job consider the labor cost item. The one way for you to cut labor costs is to have fast, efficient tools, . . . tools to make it easier and faster for the man on the job. And Greenlee Tools were designed for just that purpose. For instance the Greenlee Cable Puller, shown above, is a tool that will save many hours of work when pulling in cable. This handy tool clamps right on to the conduit through which the cable is pulled, and cuts pulling time in half. Then for bending jobs there's the Greenlee Hydraulic Benders for conduit from 1¼ to to 4½-inch, to cut labor costs and eliminate many manufactured bends and fittings. Look into the complete line of Greenlee Tools today . . . just send coupon below for Catalog 31E.

OTHER GREENLEE TOOLS TO SAVE YOU MONEY

- Hydraulic Pipe Pushers
- Knockout Tools
- Bit Extensions
- Joist Borers
- Electricians' Auger Bits

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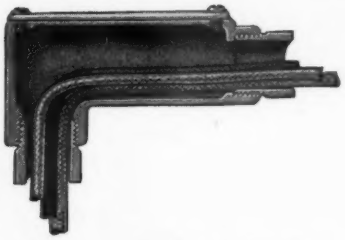
1707 Columbia Ave., Rockford, Ill.

GREENLEE TOOL CO., 1707 Columbia Ave., Rockford, Ill.
☐ SEND ME A COPY OF GREENLEE CATALOG NO. 31E.
ALSO INFORMATION ON.....
Name.....
Address.....
City..... State.....
My Jobber is.....

GREENLEE
HAND TOOLS FOR THE ELECTRICAL WORKER

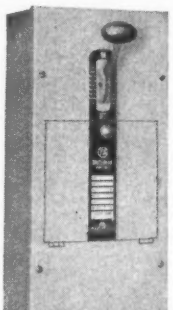


the job by making it easier to pull the wires through.

A free copy of a bulletin illustrating and describing the full line of Form 37 "Adalets" and covers may be obtained by writing to The Adalet Manufacturing Co., Cleveland, O.

Frank Adams Shutlbrak Switch

The Frank Adams Shutlbrak switch which embodies entirely new ideas in both design and construction. For either surface or flush mounting, it is a high quality, heavy duty industrial switch with quick make and quick break connections held under compression. The line and load connections are enclosed in the completely insulated shuttle, which contains the movable contacts —the auxiliary contacts on the ends of the compression springs, and the main contact roller. There is an



arc-resisting barrier between the line and load contacts at all times. Equipped with Kamklamp fuse-holders for either ferrule or knife-blade types of fuse terminals. Available either with or without an interlocking arrangement between the operating switch lever and the door of the fuse compartment. Capacities at present: 30 to 200 amp. inclusive for 250 volt a-c or d-c, and 575 volt a-c, in 2, 3 or 4 pole. (Higher capacities in preparation). Each switch is rated in horsepower. Approved by Underwriters' Laboratories. Fully illustrated in Bulletin No. 59—Frank Adam Electric Co., St. Louis, Mo.

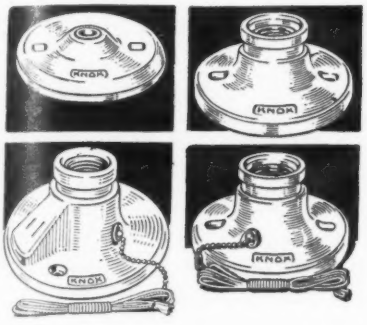
Explosion-Proof Fittings

Appleton Electric Company, 1701 Wellington Avenue, Chicago, Illinois, manufacturers of Appleton Unilets and other well-known conduit fittings, announce a new four-page bulletin Form 1050, giving a complete description of new Appleton Explo-

sion-proof Sealed Safety switches, receptacles, and lighting fixtures, especially designed for use in hospitals to prevent explosions in anaesthesia and operating rooms under all hazardous conditions. Copy of this bulletin and catalog pages will be supplied upon request.

Knox Covers and Receptacles

These porcelain covers and receptacles were designed to cover up plaster cracks, dirty spots and roughness



around boxes. They are one-half inch larger in diameter than standard and fit any 3¼-inch box. Design is modern and well proportioned. They are manufactured by Knox Porcelain Corp., Knoxville, Tenn.

Knopp Load Analyzer

The Knopp Load Analyzer, manufactured by Electrical Facilities, Inc., Oakland, Calif., is a portable instrument especially designed for making power factor and related measurements. It was developed in response to the demand for an instrument by means of which power factor measurements could be made quickly and accurately on individual loads such as fluorescent lighting equipment and neon signs.

The Analyzer, because of its multi-range feature, has a wide range which permits measurement of power factor, watts, and volts on loads of a few watts up to as high as 24,000 —48,000 watts, depending upon the voltage range.

The Knopp Load Aanalyzer accomplishes the measurement of power factor, watts, and volts in an entirely new and unique manner which offers important advantages, which very briefly stated are: power factor read directly by merely turning a knob; watts and volts also quickly read by means of same measuring element; ruggedness is an inherent feature as there are no indicating pointers or delicate movements; and accuracy is very high due to the multiplicity of ranges and the great reliability of the measuring element.

The Knopp Analyzer is available in five different models with eight current ranges from .5 to 100 amperes and potential ranges from 120 to 480 volts. Power factor measurements can be made from 10% to 85% lead. Wattages from 10 to 48,000 watts are read from a proportional linear scale.

Hudson-Belk Store, Raleigh, N. C.

SKY LUX FLUORESCENT LUMINAIRES

will help you get big jobs because of high light output, attractive appearance and their structural feature which permits coupling SkyLux units into continuous lines.

For complete catalog information, please write to

CURTIS LIGHTING, INC.

1123 WEST JACKSON BLVD.

CHICAGO, ILL.

All Keyed-up over . . .

L C SMITH

You will be too when you see it! Beautiful in appearance, easy to operate, new typing aids save time and energy. Automatic margin set. New concealed touch selector. New line space mechanism. New card holder. Plus the time proven *floating shift*, interchangeable platens and other features. Free demonstration at

The new Super-speed

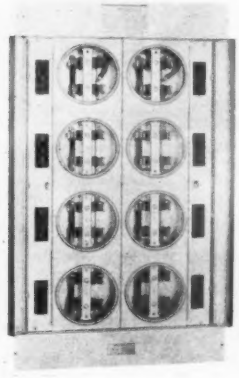
L. C. SMITH & CORONA TYPEWRITERS, INC.

701 E. Washington St., Syracuse, N. Y.

Circuit Breaker Meter Channel

An inexpensive, compact circuit breaker meter channel to fit into almost any residential building as well as many commercial structures has been annuonced by the Westinghouse Electric & Mfg. Co.

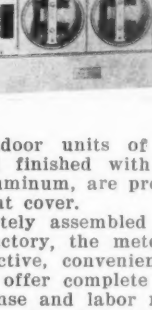
The channels, which house socket type meters and circuit breakers to provide positive short circuit and overload protection, are constructed of number 16 gauge steel. Indoor units may be flush or surface mounted. Outdoor units of galvanized steel and finished with a coat of baked aluminum, are provided with a raintight cover.



Completely assembled and wired at the factory, the meter channels are attractive, convenient, inexpensive and offer complete protection. The expense and labor necessitated by a blown fuse is completely eliminated by the use of efficient circuit breakers. Channels are made to meet all electrical and dimension requirements. For additional information, write to Dept. 8-N-48, Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa.

McGill Fixture Switch

McGill Manufacturing Company, Valparaiso, Indiana, announces a new fixture switch which embodies an exclusive arrangement for attaching wire leads to terminals. It is small, compact, strong, and has an exceptionally smooth, easy "pull." Fits wall thickness up to 5/16", and has 9" wire leads, stripped ¾". Overall dimensions, ⅝" x ⅞". Rated: 3 Amp., 125 Volts—1 Amp., 250 Volts. Listed as standard by Underwriters' Laboratories.



Chromalox Unit Heater

Chromalox announces the HF unit heater (blower type) for domestic and industrial use. Attractively finished steel heater case is provided with handle and rubber feet or pads for portable use. Brackets are available for permanent wall mounting. Adjustable louvres will direct air in desired direction. Chromalox Koilstrip elements within the heater warm air drawn in back of heater and forced out the front by quiet, cadmium-plated fan. Enclosed type electric motor drives fan, without radio interference.

Positive acting thermostatic switch automatically opens heater circuit if normal operating temperatures are exceeded—manually operated reset button will close heater circuit when normal temperatures are restored.

Manual control switch will turn on heater circuit and fan for winter use —and fan only, for summer use. For automatic temperature control—order a PA-85 thermostat at $12.75; no contactor is required.

1500 watt heaters are supplied with 10 feet of heater cord and attachment plug, approved by the Underwriters' Laboratories, to connect to ordinary outlet. All other size heaters are supplied with 10 feet of heater cord approved by the Underwriters' Laboratories — except 115 volt, 4000 watt heaters, which are supplied with line terminals to be connected to power supply.

Heaters are supplied for either 115 volts or 230 volts, 60 cycles, single-phase power supply, as specified.

Multi-Outlet Systems

With introduction of the new smaller size No. 1900 Plugmold a short time ago, two complete related systems are now available for domestic and commercial installations. Smaller No. 1900 Plugmold has a capacity of 2 wires for single circuits. Large No. 2100 Plugmold has a capacity of 6 wires for switch controlled circuits and where lumiline or fluorescent lighting is combined with outlet installations as under kitchen cabinets, etc. For further details write The Wiremold Company, Hardford, Conn.

KWIKON Set Screw "E.M.T." Fittings are

Truly Economical

Because you pay less for them* —and because you install them faster and easier — Kwikon Set Screw "E.M.T." Fittings effect savings for you right down through the finished job. That is true economy.

*Ask your jobber about the new, low prices!

Approved by Underwriters' Laboratories, Inc.

KWIKON CO. 626 W. JACKSON CHICAGO, ILLINOIS

EVERY CORY COFFEE BREWER

is Completely Equipped!

The CORY is outstanding for *beauty* and *value!* Included in the price are complete deluxe fittings for operation, convenience and smartness. They include: Hinged Decanter Cover; "Safety Stand" Funnel Holder; 2-tablespoon Coffee Measure; popular CORY Glass Filter Rod. Most models also provide the famous CORY "Fast-Flo" Filter. Both filters are speedy and

Brew Marvelous Coffee and Tea Untouched by Metal

—also flavor-protected against contact with boiling water and too long brewing. All CORY Electric Units are 2-heat. The special CORNING heat-resisting glass is decorated with genuine platinum striping. 3 CORY sizes fill all needs. Big profits from small stock. WRITE FOR COMPLETE CATALOG.

CORY Glass Filter Rod— an extra value with all CORY Brewers — is sold separately for other glass coffee makers at 50c.

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for advertising in their publications. CORY-brewed coffee is more wholesome, because it follows the 4 cardinal rules for making "perfect" coffee.

GLASS COFFEE BREWER CORP.
325 No. Wells St., Chicago, Ill.

Distribution System Economics—Part 2

(*Continued from page* 52)

return in parallel with the neutral conductor.

The matter of distribution transformer loading is important especially since what may appear to be good practice might not be the most economical. Off-hand, it might be desirable to load distribution transformers just as high as possible; and in some cases, even to the point at which their actual useful life would be shortened. A careful study of the economics of distribution transformer loading, however, shows that such a practice would probably be more costly than lighter loading.

Transformer Loading

Table I gives the results of an economic study of distribution transformer loading for an assumed load growth of approximately 7½% per year over a ten year period. This study includes the cost of losses and of loss in revenue in addition to the usual carrying charge of the transformer investment. The results of this study point to the desirability of low initial loading, say 50%, and a final loading of perhaps 125%, for greatest overall economy.

Light Flicker Considerations

The foregoing discussion of secondary design economics has been confined to a consideration of the normal steady load and has not taken into account any limitations in regard to instantaneous fluctuation, such as might be caused by motor starting currents. For the lower load densities, it is usually found that limiting the voltage drop caused by motor starting current results in an appreciable increase in the cost of a secondary system. This is illustrated by the "A" columns, Fig. 5, which are based on a load density of 10 kw per 1000 ft., the same as in Fig. 1, but also have the additional restriction of limiting the voltage fluctuations caused by a 20-ampere, .50 power factor starting current to 3 volts in the distribution transformers and the 115 volt secondary.

The most economical means of overcoming this difficulty is to bank or interconnect the adjacent secondaries. The effectiveness of this method for reducing investment is indicated by the "B" columns in Fig. 5 which show the investment in secondaries and transformers for a banked secondary system, that will limit both the instantaneous voltage fluctuations due to motor starting current, and the secondary drop due to normal load, to 3 per cent.

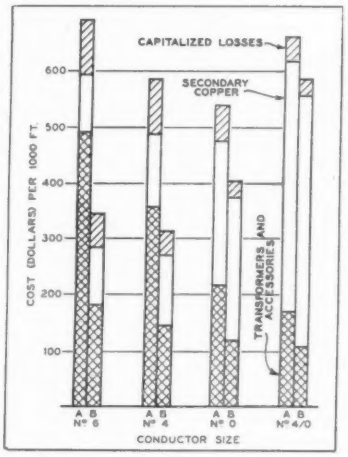


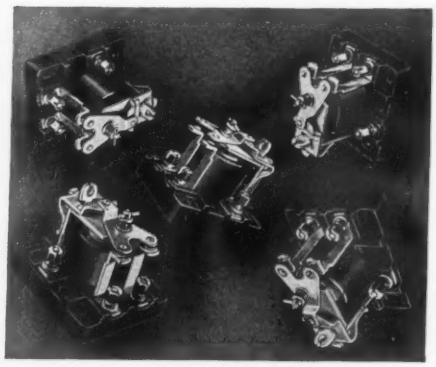
Fig. 5. Limiting the voltage drop caused by motor starting current results in an appreciable increase in the cost of a secondary system. The costs indicated by "A" columns are similar to those in Fig. 1, except that voltage fluctuations caused by 20 amp., 50% P. F. motor starting current is limited to 3 volts in transformer and secondary. The "B" columns show the effectiveness of reducing investment by interconnecting adjacent secondaries.

The effectiveness of the banked secondary system is readily understandable when it is remembered that interconnecting the secondaries of adjacent transformers will reduce by 50% the instantaneous voltage drop caused by a motor starting at the midpoint between two transformers.

In addition to reducing light flicker caused by motor starting current, the banking of secondaries has the additional advantage of increasing the diversity of loading on individual transformers, and thus greatly alleviating voltage troubles due to unbalanced secondary loads.

(Another article in this series on Distribution System Economics will appear in December issue).

RELAYS
viewed
from
every
angle



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Electric Controls Since 1892

Activities and Services of N.E.C.A.

(*Continued from page* 17)

ernment require that every electrical contractor, in self-interest, support N.E.C.A. in its endeavors to protect the industry and to render a public service.

Designated as a special benefit activity, the work of the Labor Relations Committee for I.B.E.W. employer section members is supported by special fees from more than 1,000 members of N.E.C.A. Through the careful study of the Labor Relations Committee and the contacts of the Committee's field representative, it has gained a clearer insight into the local problems of relationships between employers and their employees, and is working toward maintaining a cooperative spirit with the employees' organization, to the end that the activities of the employers' organization and the activities of the employees' organization, will harmonize and work together toward a larger and better industry.

The Labor Relations Committee has assumed joint sponsorship with the I.B.E.W. for the Council on Industrial Relations for the Electrical Construction Industry, which has proven itself an indispensable national medium for the arbitration of industrial disputes in the electrical construction industry.

The Labor Relations Committee is supported only by those members who are employers of I.B.E.W. labor and no part of the dues of other employers goes into the support of its activities. Through this method of division of N.E.C.A.'s activities into general benefit activities and special benefit activities, each member is assured of receiving the greatest possible return for his individual dues in the directions in which he, individually, can develop.

There are many things to be done; a vast wilderness of electrical construction remains practically untouched by us. There are many evils existing in the industry which are retarding our progress and they

N.E.C.A. Convention Program

(*Continued from page* 15)

1st day: St. Augustine, Daytona Beach, Titusville, Indian River City (luncheon), Sebastian, Jupiter Light, Palm Beach (stop for refreshments), Miami, McAllister Hotel (dinner and evening of entertainment).

2nd day: Miami (sightseeing), sea food luncheon; board steamer for Havana at 6:30 P.M.

3rd day: Arrive Havana 8:00 A.M. Saturday, Plaza Hotel.

4th day: Two days and night of sightseeing and entertainment. Board steamer for Miami Sunday evening.

5th day: Miami, Palm Beach, Lake Okeechobee, Sebring (luncheon), Mountain Lakes, Bok Tower, Haines City, Orlando (dinner, entertainment and night at Orlando).

6th day: Sanford, Barberville, Ocala National Forest, Silver Springs (luncheon and trip on lake), Jacksonville (farewell buffet supper).

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Here's an item that's good for a gain on every play. Heats all the air in a room, safely, quietly, and quickly! Automatically shuts off if accidentally tipped over—a natural in the home with children.

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No. 169 — Novel white essence of pearl circular knife. Light, compact—yet sturdy. Ring for pocket or watch chain. Nail file and cutting blade are of high carbon steel.

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should be removed. I believe that we can greatly improve this electrical contracting industry and make it a highly respected and profitable business, second to none. We can accomplish these things only by *influence, organization,* and *strength.*

We need more state associations, more chapters, and more members who will recognize the value of their trade associations, both local and national; who realize and accept their responsibility to the industry and the public; who are willing to cooperate; and who will give reasonably of their time and money to make a bigger and better industry.

"Use-Value" Stressed In Roaster Selling

(*Continued from page* 23)

roasters, paint a visible or word picture of good food, deliciously cooked and attractively served the electric roaster way.

"Create for the prospective buyer a mental image of a turkey or a chicken crisp-brown but tender, of a thick steak with its juice seared in, of a hot, after-theater supper. Answer the customer's unspoken question, 'What will it get me to buy this roaster?'

"Register-ringing mailing lists easily can be built up. The dealer, some member of his store personnel, or of his family, should note newspaper announcements of engagements, wedding and social activities in his territory. Lists thus compiled may be used for mail or for personal solicitation.

"The dealer's suggestion that an electric roaster will make an especially appreciated gift often solves a problem for relatives or friends of engaged or newly-married couples and of those who do a good bit of entertaining. As a holiday or anniversary remembrance, too, it makes a welcome present.

"Many dealers find that store demonstrations and cooking contests, in which electric roasters are used, create store traffic, active buying interest and a high percentage of actual sales.

"Do not forget, either, that the purchaser of an electric roaster may be, or at some later time may become, a 'live prospect' for other appliance, such as an electric refrigerator or a water heater.

"In one short sentence, electric roasters are too good a bet for any appliance dealer to pass up."

Jacksonville Chapter One of the Outstanding

(*Continued from page* 46)

results. Mr. Henderson started work on a new plan which would give both contractor and buyer assurance of a satisfactory culmination of each contract, and would smooth out the rough edges of competition between member firms. It also sought the desirable end of list price maintenance, and six years ago instituted a system of awarding contracts for installation of home electrical appliances which has served as a model for other communities throughout the country.

The first step taken was the bringing together of the factors involved in such installations: the contractors and the municipal power company which furnishes current to the Jacksonville area. All the contractors in the city were invited to the meeting, and an agreement was reached with the utility officials that contracts for future installations of ranges and water heaters would be worked through the N.E.C.A. chapter and

In St. Louis, Hotel Mayfair is the choice of seasoned travelers. They appreciate its downtown location and enjoy its friendly, restful atmosphere, courteous service, comfortable rooms and its restaurants where fine food and drink are traditional.

Every room has private bath, guest-controlled radio. Rates: 50% of all rooms $3.50 or less, single; $5.00 or less, double.

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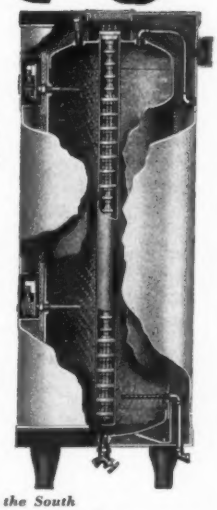

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Hard, scale-forming water and accidental 'dry' operation has no effect on this heating unit. Fastest heating due to internal circulation.

Genuine Cork Insulation

Retains original high efficiency permanently — uneffected by Moisture will not settle; vermin proof.

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Principal used in all High Grade Temperature Instruments insures instant and accurate control.

Write today for complete details of our Silver Anniversary Models.

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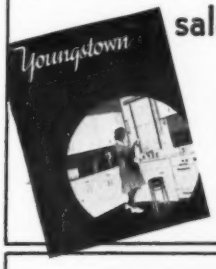
Youngstown Pressed Steel not only offers you the best quality all-steel kitchen at a low price but also gives you a proven sales plan for finding and selling your customers with a minimum of sales time and expense.



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according to predetermined standards. It was further agreed that the work would be done only by members of the association, assuring the facts that the work would be guaranteed, that it would be acceptable to all inspection, and that the contractors would meet all bills promptly. This plan was studied thoroughly and put into effect, so that the Jacksonville chapter of the association, through agreement, became responsible for the electrical installation work of the community, maintaining their own inspectors to police the field, and avoiding the variable factor which enters under a municipal inspectorship. This arrangement was first negotiated only for a six months period, but has worked so successfully that it has been in operation for the past six years.

In awarding contracts through the N.E.C.A. chapter, the secretary maintains a list of the firms doing the work, and contracts are awarded by rotation of this list. Work in the chapter is done by the committee method, competent members being assigned to study of various problems and handling details of matters coming under their jurisdiction.

In industrial relations, the chapter has solved most of the problems confronting the industry in Jacksonville. It is the medium of settling fair trade problems, union and non-union labor difficulties, and is serving as an equalizing factor between large and small businesses in open competition.

W. O. Henderson is still president of the chapter, with Rudolph Baacke, vice president, Walter T. Poole, secretary, and S. C. Reddick, treasurer. Three directors, Dixie Carroll, C. R. Lovell, and H. H. Sonnenberg, handle the policy of the chapter.

Shell Building Modernization

(*Continued from page* 9)

made it possible to retain the original conduit layout with individual circuits for each bay or working space.

All new branch wires are No. 12 as short runs from feeder circuits made it unnecessary to use any size larger than this. Only slight changes were necessary in panel boards on each floor. These are arranged so that any office or group of offices can be separately metered.

Additional sub-feeders to the upper floors are required to handle the increased load and these were provided by pulling in sufficient new sub-feeders so that each two floors are served from a single sub-feeder instead of four floors per feeder as in the old system.

The new wiring has greatly improved the voltage drop situation in this building. Whereas a drop in voltage of from 12 to 20 volts occurred between the switchboard and furtherest outlets with the old wiring, the voltage drop under the new conditions amounts to only approximately four volts.

The air conditioning system is so arranged that the upper ten floors and lower ten floors can be operated either separately or together. Each floor throughout the building has its own fan room, containing two or three 3-hp motors and blower fans for distributing the air. They take the air from the main duct and distribute it through sheet iron ducts to individual offices. These offices have dampers, thermostatic control, and special fire control.

Return air from the offices passes through transoms into hallways so that a proper circulation is maintained even with doors closed. The distribution duct lines were run parallel to the hallway just inside the office partitions.

The principal air conditioning motors included two 400 hp, one 125 hp, and three 50 hp. The switchboard control for these motors includes ammeters and kilowatt-hour meters. The switchboard for the air conditioning equipment also includes remote control push-buttons for approximately 80 motors located throughout the building.

All air in the air conditioning engine room is drawn over the large motors by a 48-inch ventilating fan. This air is filtered and no dust or foreign matter can be drawn into the engine room at any time. Each filter can be taken out and cleaned.

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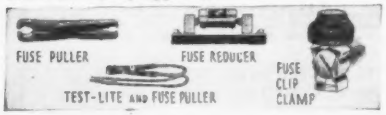

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HOT or COLD WATER from the SAME FAUCET—when you want it.

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Manufactured By

THE ELECTRIC HEATER COMPANY
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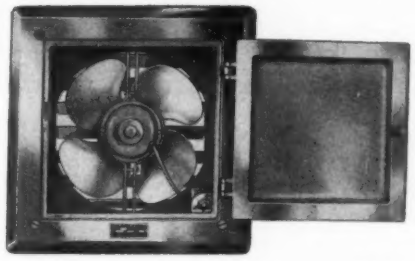

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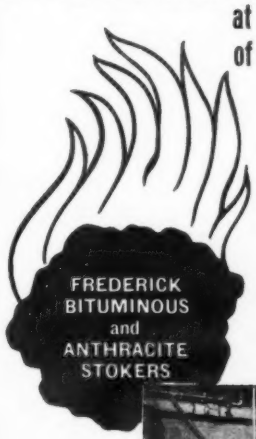
ELECTRIC MANUFACTURING CO.
MANKATO • MINNESOTA

20 AMPERES . .
2200 WATTS . .
$12.00!

A TYPE FOR EVERY HOME and HEATING PLANT at Prices well within the scope of YOUR CUSTOMERS' BUDGETS!



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(Ask about Liberal Dealers' Proposition; some good territory is still open.)

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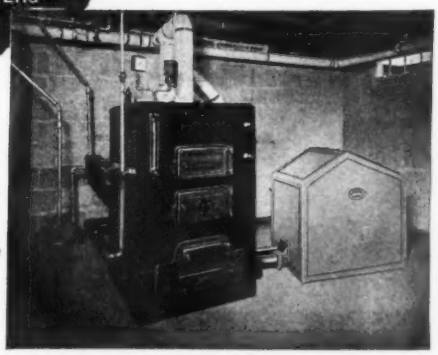

The FREDERICK IRON & STEEL CO.
P.R.R. & Eighth St.
Frederick, Maryland

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